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THE UNIVERSITY OF ALBERTA

IDENTIFYING GIFTEDNESS IN THE HEARING-IMPAIRED: THE EFFECTIVENESS OF FOUR NOMINATION FORMS

BY

BARBARA FRASER

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH

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OF MASTER OF EDUCATION

IN

COUNSELLING PSYCHOLOGY

DEPARTMENT OF EDUCATIONAL PSYCHOLOGY

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SPRING, 1987

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FACULTY OF GRADUATE STUDIES AND RESEARCH

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research for acceptance, a thesis entitled IDENTIFYING GIFTEDNESS IN THE HEARING-IMPAIRED: THE EFFECTIVENESS OF FOUR NOMINATION FORMS submitted by BARBARA FRASER in partial fulfilment of the requirements for the degree of MASTER OF EDUCATION in EDUCATIONAL PSYCHOLOGY (COUNSELLING).

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(Supervisor)

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Date: November 24, 1986

Abstract

The purpose of the study was to investigate the effectiveness of four nomination forms in identifying intellectually gifted, hearing-impaired children. All subjects in the study (N=29) were between the ages of 5 and 20 years, had hearing losses greater than 70 decibels, and were in attendance at the Alberta School for the Deaf. Group I (n=15) consisted of students nominated by teachers as gifted; Group II (n=14), the comparison group, consisted of age-matched students who had not been nominated as gifted.

The four nomination forms used were: Scales for Rating Behavioral Characteristics of Superior Students (SRBCSS) (Renzulli, Smith, White, Callahan, & Hartman, 1976), Rating Gifted Students (RGS) (Edmonton Public School Board, 1985), Teacher Observational Items (TOI) (Pledgie, 1982), and Nomination Form for Potentially Gifted Students (NFPGS) (Nasca, 1980). For each subject in the study, a set of four nomination forms was scored by the homeroom teacher. IQ scores for each subject were gathered from school files.

The results demonstrated that, for this hearing-impaired sample, 1) the nominated group (Group I) had a higher mean IQ percentile and a higher mean score on the nomination forms than Group II; 2) there was no relationship between IQ percentile and nomination form scores, and 3) the four nomination forms were significantly correlated for Group I, while the RGS, TOI and NFPGS were correlated for Group II. Qualitative data gathered from teachers of the hearing-impaired indicated that perceived characteristics of giftedness in this population are

essentially the same as those observed in hearing children except that gifted hearing children are likely to be working above grade level, whereas gifted hearing-impaired children were more apt to be working at grade level.

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Finally, without the exhortations, emotional and material support of family and friends, this document might never have reached the library shelf.

Parturient montes, nascetur ridiculus mus.

- Horace

Ars Poetica

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CHAPTER ONE

INTRODUCTION

Background

While giftedness is as old as human history, the recognition of the need to nurture and develop it, by comparison, is still in its infancy. Only in the latter part of this century, in North America, has there been a widespread attempt to identify the needs of gifted children, and to address these in the formal educational process.

Giftedness is defined, to a certain extent, by the social context in which it occurs. Gifted individuals are identified as such because they manifest ability, knowledge, and/or skills which are superior in quality and quantity to those found in the majority of individuals around them.

In assessing children for giftedness, there is a tendency for the gifted individual to be compared to a reference group which is, most often, an "average" school population. Groups which are poorly represented in, or are excluded from, the "average" school population include: the disabled, cultural minorities, and the disadvantaged. Although some individuals with these exceptionalities are in the regular school system, many others are placed in separate programs designed to address the needs of their primary form of exceptionality (disability,

lack of command of the English language, educational and/or social delay due to an impoverished environment).

For children with disabilities, as with other forms of exceptionality, the educational focus has been on the exceptionality, and not on the learning potential of the child (Texas School for the Deaf, 1980). Hence, a child with a physical disability is usually placed in an educational setting appropriate for his/her disability, with little attention being given to his/her intellectual capabilities. While placement in a specialized setting can provide a child with the human and mechanical resources which enable him/her to participate in the educational process, too often these resources become substitutes for content appropriate to the child's abilities. Aids should be tools to enable, not to replace, intellectual and academic ability.

The limited availability of literature on giftedness in the disabled raises the suspicion that disability and giftedness are seen as mutually exclusive phenomena and, therefore, in combination, not meriting investigation or consideration (Maker, 1977; Pledgie, 1982). Again, focus is on the limitations, or supposed limitations, resulting from the disability/ies. While a disability can be described in many ways such as etiology, essential characteristics, and behavioural manifestations, the degree to which it handicaps, or limits the functioning of, a particular individual is partly a function of that individual's ability to cope with or adapt to his/her disability. Realization that disabilities can mask the expression of giftedness

necessitates the search for and development of alternate and suitable means of identifying giftedness in disabled individuals.

The impact of these findings leads to the development of the present investigation into giftedness in one disability group, the hearing-impaired. Although there is abundant literature on giftedness and on hearing impairment, to date, little consideration has been given to the area of giftedness in the hearing-impaired.

It is evident in the literature that there is considerable variability in the type of criteria and associated cutoff scores employed to determine which students should receive gifted programming. While definitions of giftedness vary, ultimately, the determinants of the nature and extent of a gifted program are: the available financial and human resources. Whatever procedures and measures are used to identify eligible participants must be related to the program objectives. With many identification measures from which to choose, an educator faces the considerable task of evaluating and selecting measures which will be appropriate for a particular population and for the types of gifted program offered.

Rationale

The rationale for the present study can be thought of in two ways: as a challenge to the popular assumption that disabilities and giftedness rarely, if ever, co-exist; and as an opportunity to enlarge a meagre knowledge base and thereby further the understanding of the nature of giftedness in the hearing-impaired.

Purpose

The present study focussed on one "exceptional" population, the hearing-impaired, to determine, through the use of nomination forms, if potentially gifted hearing-impaired students could be identified, and if there was any relationship between the characteristics of giftedness evaluated by the forms, and their IQs.

Methodology

The study consisted of two parts.

The first part involved having teachers nominate students who they thought were gifted, using four nomination forms. An age-matched comparison group of equal size was then selected. The nomination and IQ scores for each group were correlated, and the results examined for patterns of relationships between the characteristics of giftedness evaluated and IQ.

The second part of the study involved interviewing the teachers who completed the nomination forms, to discover their ideas about the nature of giftedness in the hearing-impaired, and the usefulness of the forms used.

Results

The results from the first part of the study indicated that, for both groups, there was no significant relationship between any of the

measured characteristics of giftedness and IQ. However, each of the nomination forms was found to be capable of distinguishing between students thought to be gifted, and those thought to be not gifted. In other words, aside from IQ, there were observable differences between the two groups in terms of gifted characteristics.

From the data gathered in the second part of the study, it was evident that the gifted hearing-impaired share with their gifted hearing peers many of the same characteristics.

Implications

The results of the study are consistent with the findings of the very few other studies in this area (Texas School for the Deaf, 1980; Whiting, Anderson, & Ward, 1980) that giftedness in the hearing-impaired does exist, can be identified, is manifested in ways remarkably similar to those found in the hearing population, and is an area deserving of programming within the educational system.

Further research is needed to investigate more subtle similarities and differences in gifted characteristics in the hearing-impaired as compared to the hearing population; to refine nomination and identification procedures, specifically for use with the hearing-impaired; and to develop appropriate programming for gifted hearing-impaired students.

CHAPTER TWO

REVIEW OF THE LITERATURE

Giftedness: Development of the Concept

Throughout history, individuals who stand out because of some superior ability have been variously labelled as "gifted," "genius," "talented," "bright," "precocious," or "creative." In this connection, one thinks of individuals such as Pascal, Mozart, Mill, Galton, and Einstein.

Current interest in giftedness can be understood as emanating from five events, beginning in the late nineteenth century with the pioneering work of intelligence measured by Sir Francis Galton, followed by the development of the Binet-Simon intelligence test in France, and its Americanization by Lewis Terman; the push of Leta Hollingworth for gifted education, and the space race (Davis & Rimm, 1985).

Influenced by Darwin's theory of evolution by natural selection, Galton observed that superior intelligence and outstanding accomplishment seemed to run in families. He believed that superior sensory powers--vision, audition, tactility, and reaction time--were the result of natural selection and heredity, and essentially, accounted for superior intelligence. However, he omitted to observe that the families whose members exhibited outstanding ability and behaviour most often

belonged to the privileged class with its attendant economic, social and educational benefits and opportunities.

In the 1890's, Alfred Binet, together with Victor Henri and Theodore Simon, under the auspices of the French government, devised a test to identify mentally retarded children who would benefit from remedial education (Sattler, 1982). The test measured attention, memory, judgment, reasoning, and comprehension. Binet advanced the idea of mental age, "the concept that children grow in intelligence, and that any given child may be at the proper stage intellectually for his or her years, or else measurably ahead or behind" (Davis & Rimm, 1985, p. 5). The corollary to this idea is that children who demonstrate superior learning abilities do so partly because of greater intelligence.

Binet's test of mental abilities found ardent support in the United States, principally through the work of Lewis Terman at Stanford University. Terman was responsible for the Americanization of Binet's test, resulting in the Stanford-Binet Intelligence Scale, and the establishment of American norms. Using the Stanford-Binet test, Terman conducted a longitudinal study on approximately 1500 gifted children, following them into adulthood.

> On follow-up in middle age (Terman & Oden, 1959), the gifted group, in comparison to a random sample of the population, were found to have more education, higher incomes, more desirable and prestigious occupations, more entries in Who's Who, better physical and mental health, a lower suicide rate, a lower mortality rate, a lower divorce rate, and brighter spouses and children. The follow-up demonstrates that IQs do relate to accomplishments outside of school [and continue into adulthood] (Sattler, 1982, p. 439).

Terman's study has been criticized on the basis that there was overrepresentation of children from homes of professional, well-educated, urban, white parents, and who, therefore, had the obvious advantages which accompany this socioeconomic position. Also, in a number of cases, more than one child, and as many as five children, came from the same family (Laycock, 1979). Despite these criticisms, other studies (Cox, 1926; Witty, 1940) have supported Terman's findings that superior intelligence and accomplishments in childhood tend to continue through adulthood.

While early studies tended to focus on the cognitive abilities of the gifted, Leta Hollingworth's work (1926, 1942) focussed on social adjustment of the gifted. From her studies of gifted children in the State of New York, she observed that there was increasing social maladjustment with increasing IQ. She believed that individuals with IQs between 125 and 150 exhibited optimal adjustment and, therefore, were best able to use their abilities for both personal fulfillment and social responsibility. Individuals with IQs in excess of 170, she noted, often tend to be misunderstood, and to have few satisfying interpersonal relationships (Laycock, 1979). Finding that many bright children in her study experienced frustration, discouragement and boredom with their schooling lead Hollingworth to develop experimental curricula, which were used in New York State schools (Laycock, 1979). Hollingworth felt that intellectual superiority does not excuse an individual from social development and, to that end, the gifted child

would do well to develop patience and learn to suffer fools gladly, not grudgingly (Hollingworth, 1942).

Interest in gifted education waned until the 1950's when the space race began with the Russian launching of the satellite Sputnik. This apparent technological coup on the part of the Russians caused American educators to examine the education of America's future scientists, and quickly to develop programs to foster and develop giftedness and talent, particularly in Mathematics and the Sciences. This wave of enthusiasm lasted about five years (Davis & Rimm, 1985).

The current groundswell in gifted education began in the early 1970's. In the preceding decade, the personal growth movement (Rogers, 1959; Maslow, 1962) began to shift the psychological focus from collective social responsibility to the need for personal fulfillment, or self-realization (Maddi, 1976). This change in perspective, in turn, can be seen as a key factor in the rise of personal and group rights movements. The present interest in gifted education can be attributed, in part, then, to a combination of both social and personal concerns.

Giftedness: Definitions

At present, there is no standard term for, or definition of, giftedness (Karnes & Koch, 1985). In the literature, one encounters the terms: "gifted," "talented," "gifted and talented," "potentially gifted," "bright," and "very able." Attempts have been made to differentiate among the terms "gifted," "talented," and "potentially gifted" (Ehrlich, 1982; Gagné, 1985; Lambkins, 1977). However, in

practice more gifted programs make no such distinction. Despite the diversity of philosophical orientation concerning giftedness, operational definitions adopted by school boards are largely determined by legislation, and available financial and human resources.

The two most influential definitions of giftedness in current use are those of the U.S. Office of Education (cited in Alberta Education, 1984), and Renzulli (1978). The 1978 revised definition of the U.S. Office of Education states that:

> The term gifted and talented children means children, and whenever applicable, youth, who are identified at preschool, elementary, or secondary level as possessing demonstrated or potential abilities, that give evidence of high performance in areas such as intellectual, creative, specific academic, or leadership ability, or in the performing and visual arts, and who by reason thereof, require services or activities not ordinarily provided by the school. (p. 11)

The original 1972 definition added a sixth area of giftedness, psychomotor skills.

Renzulli (1978) defined giftedness as follows:

> Giftedness consists of an interaction among three basic clusters of human traits--these clusters being above-average general abilities, high levels of task commitment, and high level of creativity. Gifted and talented children are those possessing or capable of developing this composite set of traits and applying them to any potentially valuable area of human performance. (pp. 63-64)

While there is some overlap between the two definitions, the U.S. Office of Education's definition emphasizes specific giftedness in one or more areas, whereas, Renzulli sees giftedness as a global attribute, a product of interaction among three basic factors.

For this study, the term "gifted" was chosen to include all aspects of giftedness, and to be synonymous with other terms currently in use. The definition adopted for the purposes of this study was that formulated by the Alberta Department of Education (Alberta Education, 1984); it is based on that of the U.S. Office of Education:

> Gifted and talented pupils are those who by virtue of outstanding abilities are capable of exceptional performance. These are children who require differentiated provision and/or programs beyond the regular school program to realize their contribution to self and society.
>
> Children capable of exceptional performance include those with demonstrated achievement and/or potential ability in one or several of the following areas:
>
> a) general intellectual ability,
> b) specific academic aptitude,
> c) creative or productive thinking
> d) visual and performing arts.

While acknowledging the importance of all areas mentioned in this definition, the present study focussed primarily on intellectual giftedness because the greatest amount of research on the hearing-impaired has been done in this area. However, research is needed in each of the other areas, as well.

Giftedness: Characteristics

At present, there are many lists of characteristics of giftedness. A particular gifted individual may manifest some or all of them. No single characteristic or cluster of characteristics has been established as the definitive indicator of giftedness. The characteristics can be present in varying degrees of intensity, and may be present, to a certain extent, also in those not regarded as gifted. There is general

agreement, however, that the traits often appear early in childhood; that there is usually a cluster of characteristics rather than a single characteristic; and that the degree of intensity of the characteristics is greater than that normally seen (Clark, 1983; Davis & Rimm, 1985; Ehrlich, 1982). Some traits, however, are inconsistent with each other: for example, "energetic," "outgoing," "solitary," "withdrawn."

Gifted characteristics can be categorized in several ways, such as: intellectual, affective, physical, and creative. Opinion differs as to which of these--singly or in combination--is most important. Table 1.1 lists the categories favoured by several authors. Each of the authors cited arrived at the categories after reviewing existing checklists and articles on giftedness.

Table 1.1

Categories of Gifted Characteristics

Davis & Rimm (1985)	Clark (1983)	Tuttle & Becker (1980)	Ehrlich (1982)
Intellectual	Cognitive	Personal	Cognitive
Affective	Affective	Interpersonal	Affective
Creative	Physical/ Sensory	Processing	Creative
	Intuitive		Physical
	Social		

It is apparent from the literature that characteristics of giftedness are thought to occur mainly in the cognitive, affective, and creative domains. Table 1.2 lists types of characteristics which are commonly associated with each of these areas.

Table 1.2

Characteristics of Giftedness

Cognitive

Language: receptive and expressive
Attention, concentration
Memory
Spatial relationships
Thought processes: content, speed, logic, originality, comprehension, synthesis, generalization
Planning, organization
Range of information and interests

Affective

Emotional stability
Humour
Independence
Self-confidence
Dependability
Persistence
Enthusiasm
Curiosity

Creative

Originality
Esthetic appreciation
Divergent thinking
Skills in the visual and performing arts

Some authors (Clark, 1983; Ehrlich, 1982) add characteristics pertaining to the physical realm such as: few health problems, high energy level, and early motor development.

Giftedness: Problems

While, for the most part, the foregoing characteristics may be regarded as positive and capable of enhancing development, they can also be construed negatively by teachers, peers, and parents (Clark, 1983; Tuttle & Becker, 1980). Curiosity may be seen as impertinence or rudeness; persistence as stubbornness; sensitivity as overreactivity and instability. Viewed in this way, the gifted child may be labelled as deviant and a trouble-maker. For the child, as well, characteristics of giftedness can lead to negative outcomes. For example, advanced knowledge and quick comprehension can lead to boredom and frustration, rebellion, or withdrawal; evaluation or self and others can lead to perfectionism, conceit, intolerance of others, unwillingness to try new tasks, discouragement and underachievement; persistence can develop into stubbornness and lack of cooperation (Clark, 1983; Davis & Rimm, 1985; Whitmore, 1980). Discussion of the negative aspects of giftedness can be found in the literature under headings such as "underachievement," and "counselling of the gifted."

Gifted Educarion in Canada

According to the 1978-79 Canadian Education Association survey (Borthwick, Dow, Levesque, & Banks, 1980), 30% of the responding school boards (n=316) were conducting or piloting programs for gifted students.

The researchers found that Canadian school boards typically used one or more of three types of criteria for giftedness: (a) objective,

based on test results; (b) descriptive, based on checklists of characteristics; and (c) comparative, which compare the gifted individual to the majority of students. Most respondents estimated that each of these criteria types would identify as gifted 2-3% of the school population. Although the survey reported the total number of students identified as gifted in Canada, it did not report what percentage of the Canadian school population this represents.

With respect to identification procedures, there was heavy reliance on teacher selection and test results. Table 2.1 lists identification procedures currently in use in Canada, from most frequent to least (adapted from Borthwick et al., 1980, p. 57).

Table 2.1

Canadian Identification Procedures

Teacher selection	Most frequent
Individual test--psychological	↑
Individual test--academic	↑
Group test--academic	↑
Group test--psychological	↑
Parent selection	↑
Peer selection	Least frequent

Many respondents commented that the use of multi-dimensional definitions and multiple criteria made selection and identification a difficult and time-consuming task. Despite the reported use of multiple criteria, one third of the respondents indicated that a minimum IQ cutoff score was employed to determine which students would be admitted to a gifted program. The reported minimum acceptable IQ score ranged from 115 to

140, with an average of 130. Since norms vary with the IQ test used, these figures should not be overinterpreted. Table 2.2 shows, in decreasing order of frequency, the criteria frequently used in Canadian schools for admission to a gifted program (adapted from Borthwick et al., 1980).

Table 2.2

Criteria Required for Admission to Gifted Programs

High performance	92%
Parent permission	69%
Individual IQ test	40%
A specific minimum IQ score	35%
Group IQ test result	31%
Aptitude test result	27%

Because many respondents used multiple criteria, the total percentage of responses equals more than 100%.

In short, the survey showed that education of the gifted in regular schools across Canada is beginning to be addressed through the development of a variety of programs. It also indicated that, because education is a provincial responsibility, there is no national agreement on the definition of giftedness or on identification criteria.

Giftedness: Identification

Once a school board has decided to offer special programming for gifted students, and has determined the goals of such programs, together

with available resources, it then faces the considerable task of devising an effective identification procedure.

In the literature on identification of the gifted, one finds a variety of both terminology and processes. This is a reflection of the differences in conceptualization and practice. Table 3.1 illustrates this variety.

Table 3.1

Models of the Identification Process

Model Type	Author	Stages I	II	II	IV
I-P[a]	Achey-Cutts & Garvin (1983)	Nomination	Screening	Selection	Placement
I-P	Clark (1983)	Screening	Identification	Assessment	
I-P	Martinson & Lessinger (1960)	Screening	Identification	Program planning	
A-E[b]	Renzulli (1981)	Talent pool	Enrichment		
I-P	Tannenbaum (1983)	Screening	Selection	Differentiation	

[a]Identification-Placement

[b]Assess-Educate

Birch (1984) believes that there are two basic identification models: Identification-Placement, and Assess-Educate. The former, which is based on the use of cutoff scores, is exclusive, while the

latter is descriptive and inclusive. Of the two models, the Identification-Placement one is more frequently used. However, while it identifies a smaller number of eligible students and seems to be the more economical of the two, Renzulli (1981) argues that the Assess-Educate model, of which his Revolving Door model is an example, is more effective in terms of cost and quality of education because it requires less assessment, can be implemented in the regular classroom, and results in the participation of a greater number of students. The choice of model, therefore, seems to be influenced by both available resources and general consensus.

The Identification-Placement models, which are the ones most frequently employed, usually consist of three stages, each designed to reduce the number of eligible students until, in the final stage, the percentage or number who can be accommodated is reached.

During the Nomination and Screening stages, any or all of the following may be used: standardized IQ and achievement tests, school grades, creativity measures, product evaluations, behavioural checklists, nomination forms, rating scales, and student interviews (Achey-Cutts & Garvin, 1983; Clark, 1983; Davis & Rimm, 1985). The final selection phase involves evaluation of the assembled data, and application of a fixed percentage to determine which students will receive special programming.

In a survey of gifted programs, Kirschenbaum (1979) found four types of identification procedures in use, each of which corresponded to specific program objectives. These are summarized in Table 3.2.

Table 3.2

Types of Identification Procedures

Criteria	Program Objectives
- Academic excellence in at least one area	- Develop creativity: complement intellectual giftedness
- Academic excellence (high test scores)	- Academic enrichment
AND	
- Artistic excellence (high test scores)	- Arts enrichment
- Student interests	- Enrichment
- For disabled students: student interests and creative excellence	- Enrichment

Of the 28 academic gifted programs surveyed in the Kirschenbaum study, over half used a cutoff score of 130 on a group or individual IQ test.

Nomination Forms

Nominations can come from one or more of the following sources: parents, teachers, peers, or self. Each has a unique point of view with respect to a potentially gifted child. The term "nomination form," in this context, means any kind of checklist, rating scale, or

questionnaire the purpose of which is to nominate for special programming students who may be gifted.

Parents have been found to be effective in identifying giftedness in young, pre-school, and kindergarten-aged children (Davis & Rimm, 1985; Ehrlich, 1982), particularly in the area of physiological development, and checklists have been designed for this purpose (Davis & Rimm, 1985, Appendix 4.2; Ehrlich, 1982, pp. 28, 30-31). However, the reliability of parent ratings can be seriously affected if the parent does not know his/her child well, is unable to understand his/her child's giftedness, overestimates the child's giftedness, and/or projects his/her desire to have a gifted child.

While teachers do not have as good a view as parents of a child's physiological development, they are in a good position to observe a child's cognitive, academic, and social growth.

Although some school boards use a brief screening form initially (Davis & Rimm, 1985, Appendix 4.1; Whiting, Anderson & Ward, 1980), others use a rating scale to accomplish simultaneously the dual purposes of nomination and evaluation.

Because of the multiplicity of characteristics thought to be associated with giftedness, checklists and rating scales vary considerably in content. Any particular checklist or rating scale can contain items in one or more of the following areas: intellectual, cognitive, perceptual, psychomotor, creativity, visual and performing arts, leadership, and planning. Items and entire scales have also been

developed to help identify gifted underachievers (for example, Nasca, 1980).

Checklists may require the rater to rank order students on each given characteristic; indicate the presence or absence of a characteristic; or to indicate the degree to which a characteristic is thought to be present (e.g., to assign a number from 1 to 4).

Whatever the content of the form, there is evidence to indicate that the use of a form which lists behaviours to be evaluated (for example, "Uses a large number of words easily when s/he speaks"), and requires the teacher to assign a numerical value to each behaviour, results in increased accuracy in the identification of gifted children (Ashman & Vukelich, 1983). The four forms chosen for use in the present study have these two qualifications.

Peer and self nominations are rarely used, although the limited number of studies conducted on them indicate that both are effective (Cox & Daniel, 1983; Davis & Rimm, 1985; Tannenbaum, 1983). Peer nomination was found to be most appropriate in the elementary grades, while self nomination was recommended for use at the junior and senior high school levels where peer pressure may cause students to hide their abilities. A peer nomination form might ask children to name who of their classmates is, for example, the smartest, the best reader, has the best ideas. A sample peer nomination form is given in Davis & Rimm (1985, Appendix 4.3). A self nomination form could be a checklist or a rating scale, identical with those used by teachers.

Identification: Problems

The identification process is not without pitfalls, especially in the areas of instrument selection, cutoff scores, and rater reliability. Since the present study used teacher nomination forms, the following discussion will relate primarily to this type of form.

In the first place, it is essential that the assessment instruments selected measure those abilities relevant to the special programs to be offered. In this connection, it is worth noting that many instruments, such as checklists and rating scales, have no established validity and reliability, which can lead to considerable variability in matters of scoring and interpretation.

Secondly, cutoff scores can discriminate against the atypical learner: the underachiever, minorities, disadvantaged, culturally different, and handicapped (Feldhusen, Asher, & Hoover, 1984; Kirschenbaum, 1983). As well, an IQ or achievement cutoff score cannot define global giftedness (above cutoff), nor the presence (above cutoff) or absence (below cutoff) of giftedness. The gifted individual, like any other individual, has both strengths and weaknesses, and possesses gifted characteristics in varying degrees of intensity.

Thirdly, the reliability of teacher ratings has been found to be notoriously poor (Gallagher, 1966; Martinson, 1974; Rimm, 1984). Various studies (Clark, 1983; Pegnato & Birch, 1959) have estimated that between 10 and 55% of gifted students are missed during teacher selection procedures. However, teacher effectiveness in identifying

gifted students greatly improves after appropriate inservice training on gifted characteristics and on the proper use of behavioural checklists and rating scales (Ashman & Vukelich, 1983; Borland, 1978; Gear, 1976; Kranz, 1981).

The IQ Test As Identification Measure

In most gifted programs, evidence of superior cognitive ability, which is often regarded as synonymous with learning potential, is frequently a major factor in selecting a student for gifted programming (Davis & Rimm, 1985; Kirschenbaum, 1983; Borthwick et al., 1980). An individually administered IQ test, such as the Stanford-Binet or WISC-R, is usually preferred to a group administered test, because the former has higher validity and reliability, samples a wider variety of abilities, accommodates a wider variety of response styles, and can identify the gifted underachiever (Davis & Rimm, 1985; Sattler, 1982). However, variables such as age, socioeconomic status, prior learning opportunities, and cultural background influence performance on an IQ test. Maloney and Ward (1976, p. 226) found that "at higher intellectual levels, other factors such as motivation, interest, and personality variables become progressively more influential in terms of behavioral outcomes." Thus, it is not sufficient to identify a child as gifted using only a global IQ score. It is also necessary to describe his/her relative strengths and weaknesses so that these can be addressed in special programming.

Although consensus favours the use of multiple criteria in the

giftedness identification process, the weighting of each criterion or measure varies widely (Kirschenbaum, 1983; Tannenbaum, 1983). As mentioned previously, there is a marked tendency to assign the greatest weight to IQ and other test scores.

Gifted Handicapped

Although there are, as yet, no data to support the idea, Maker (1977) believes that the incidence of giftedness among the handicapped is the same as that for the non-handicapped, that is 3-5% of the population. Because handicapping conditions are so varied in both their nature and effects, it does not seem reasonable to assume that the incidence of giftedness, or any other characteristic, for that matter, would be the same for all conditions. Treffinger (1982, p. 4) states that: "sample statistics are just not the same as population parameters in samples that are neither random nor representative."

Because the characteristics and effects of handicaps are so diverse, very few generalizations can be made. Each handicapping condition has to be separately considered, together with its manifestation in the individual, and his/her adaptation to the condition. A gifted handicapped individual must be seen not only in terms of his/her disability, but in terms of his/her unique combination of marked strengths and weaknesses (Maker, 1977).

Because a disability can mask ability, Maker (1977) argues for the examination of indicators of potential rather than samples of

performance. She maintains that, since handicaps cause a unique effect on abilities and areas of functioning, the use of the global IQ score alone to identify giftedness in the handicapped is inappropriate since it does not reflect: the unique effect of the disability, cognitive abilities, or the individual's actual potential. As well, a global score, for handicapped and nonhandicapped alike, does not indicate general and specific ability patterns nor relative strengths and weaknesses, except in a general way. Some disabilities involving vision, audition and/or language, can be the cause of chronic sensory and/or experiential deprivation, both of which can lower IQ scores and lead to an underestimation of an individual's cognitive ability.

Because an IQ score may not reflect accurately a child's ability, Maker (1977) argues for the additional examination of indicators of potential giftedness. She suggests using a measure such as Torrance's Checklist of Creative Positives (Torrance, 1974), which was developed to aid in identifying gifted potential in the culturally and economically disadvantaged. Torrance's creative positives, or, "hidden talents," include characteristics such as: the ability to improvise with commonplace materials, storytelling, role-playing, abilities in the visual and performing arts, problem-solving, humour, richness of language and emotional responsiveness. Other appropriate indicators that Maker mentions are: intense student interests, high task commitment, and characteristics found on behavioural checklists and rating scales designed specifically for this population (e.g., Teacher Observational Items, Pledgie, 1982).

In instances where a test is used, Maker (1976) suggests that the test be modified to make the test possible, not easier. She also suggests that tests should be devised which examine those abilities which will best enable a handicapped person to be successful, given his/her handicap. For example, to succeed, a deaf person requires a good ability to perceive and understand visual cues and relate these to abstract symbols: that is, to sign language. This kind of test would examine an individual's competencies in his/her optimal mode/s in receptive and expressive language. In general, teachers of the handicapped and the non-handicapped alike tend to nominate as gifted, those students who are cooperative, conforming, and who are not behaviour problems (Davis & Rimm, 1985; Eisenberg & Epstein, 1981; Maker, 1977; Pledgie, 1982).

In terms of placement, although both giftedness and disability are forms of exceptionality, each with unique educational requirements, a child possessing both characteristics is usually placed in an educational setting appropriate to his/her disability (Texas School for the Deaf, 1980). If a handicapped child is placed in a regular classroom and, at the very least, is keeping pace with his/her peers, the placement is regarded as satisfactory, and no further investigation, especially for giftedness, is usually undertaken (Davis & Rimm, 1985; Texas School for the Deaf, 1980).

Hearing Impairment

Definitions

Hearing impairment is a generic term which refers to any kind of hearing disability, and includes the categories of "deaf," and "hard-of-hearing" (Bess & McConnell, 1981; Quigley & Paul, 1984). As a general guideline, a deaf person is one whose hearing disability prevents the processing of linguistic information through audition, with or without a hearing aid. A hard-of-hearing person is one who, with the use of a hearing aid, usually has residual hearing sufficient to enable the processing of linguistic information through audition (Brill, MacNeil, & Newman, 1986). There are, however, individuals whose functioning is atypical for their degree of hearing loss.

Categories of Hearing Loss and Associated Effects

There are different opinions regarding the exact decibel (dB) ranges for the various degrees of hearing loss (Brill et al., 1986; Calvery & Silverman, 1983; Karchmer, 1985; Ross, 1982; Salvia & Ysseldyke, 1985). Table 4 illustrates the effect of the various degrees of hearing loss on language and speech reception and expression, together with educational and audiological interventions usually required.

Table 4

Effects of Level of Hearing Loss

Hearing Level in dB[a]	Descriptive Term of Hearing Loss	Probable Handicap, Needs, and Effect on Language and Speech
-10 to 26 dB[b]	Normal limits	No significant handicap for most children. Some at upper limits may have difficulty in sustained attention and may benefit from a hearing aid.
27 - 40 dB	Mild	Slight handicap for some, but significant for many children. Difficulty hearing faint speech and speech at a distance; needs preferential seating; may benefit from lip-reading instruction; benefits from the use of a hearing aid. Will not usually experience difficulty in school situations.
41 - 55 dB	Moderate	Significant handicap. Understands conversational speech at a distance of 3 to 5 feet; needs a hearing aid, auditory training, lip reading, speech correction, and preferential seating. May exhibit limited vocabulary and speech anomalies.
56 - 70 dB	Moderate to severe	Marked handicap. Conversation must be loud to be understood; difficulty in groups and classroom discussions even with a hearing aid; same needs as child with significant handicap; may be in a special class for the hearing impaired and integrated into a regular class. Is likely to have defective speech. Is likely to be deficient in language use and comprehension. Will have evidence of limited vocabulary.

Table 4, continued

Effects of Level of Hearing Loss

Hearing Level in dB[a]	Descriptive Term of Hearing Loss	Probable Handicap, Needs, and Effect on Language and Speech
71 - 90 dB	Severe	Severe handicap. May hear a loud voice 1 foot from the ear; may identify environment noises; same needs as a child with significant handicap; may enter a regular class at a later time. May be able to discriminate vowels but not all consonants. Speech and language defective and likely to deteriorate. Speech and language will not develop spontaneously if loss is present before 1 year of age.
More than 90 dB	Profound	Extreme handicap. May hear some loud sounds; probably does not rely on hearing as a primary communication channel; needs a special class or school for the deaf; some of these children may be integrated into regular high schools. Speech and language defective and likely to deteriorate. Speech and language will not develop spontaneously if loss is present before 1 year.

[a]Average hearing levels for 500, 1,000, and 2,000 Hz (re: American National Standards Institute [ANSI] 1979 standards for pure-tone audiometers).

[b]Some children with hearing levels within a normal limit are not free from otologic abnormalities, but these abnormalities are not necessarily educationally handicapping.

SOURCE: Reprinted, with slight adaptations. From J. Salvia and J.E. Ysseldyke, Assessment in Special and Remedial Education. 3rd ed. Boston, Houghton and Mifflin, 1985, p. 230, and S.P. Quigley and P.V. Paul, Language and Deafness. San Diego, Ca., College-Hill Press, 1984, pp. 4-5.

While it can be seen from Table 4 that students with hearing losses of less than 70 dB have special educational needs associated with difficulties with language and speech, only those subjects with a hearing loss of 70 dB or greater were included in the research project of which this study formed a part. This criterion for hearing loss was adopted because it is the minimum hearing loss level at which Alberta Education regards a student as being "legally" deaf, and therefore, eligible for educational funding.

While the typical effects of the various levels of hearing loss have been described above, there are exceptions. Some children whose hearing loss is minimal to mild (0-25 dB) or severe to profound (71 dB or more), function atypically for the degree of hearing loss. Because of the nature of the hearing loss, a child with a minimal to mild hearing loss, for example, might have good oral communication, but relatively poor comprehension, be inattentive, easily distracted, and display emotional lability. At the other extreme, a child with a severe to profound hearing loss might function as well as a hard-of-hearing child because of factors such as superior lipreading and language skills.

Assessment of Hearing Loss

Decisions regarding appropriate medical, audiological, and educational interventions are based, in part, upon a child's degree of hearing loss. This is assessed by pure-tone audiometry, a test which

measures hearing sensitivity in each ear, for both loudness (intensity) and pitch (frequency). Results are usually reported as a pure-tone average (PTA) in the better ear, that is, the average loss in decibels (dB) for the three frequencies (500, 1,000, and 2,000 Hertz) which contain the majority of English speech sounds. It is usually agreed that a child with a hearing loss of 25 dB or greater has an educationally significant hearing loss (Bess & McConnell, 1981; Salvia & Ysseldyke, 1985), although hearing losses of less than 25 dB, especially in pre-school children have been reported to impede language development, and the development of auditory perceptual skills. This increases the likelihood of such a child having a significant learning disability (DeConde, 1984).

Types of Hearing Loss

The type of hearing loss refers to the site of the lesion or damage, indicating if the impairment is conductive, sensorineural, neural, mixed, or central. Conductive hearing loss involves only the outer or middle ear, and is usually treatable medically or by amplification. Sensorineural hearing loss, the most common type reported among children in special education settings, such as the Alberta School for the Deaf, results from damage to the sensory receptors in the inner ear, is usually medically irreversible, and is only partially aided by amplification. Neural hearing loss involves damage to the auditory nerve after it leaves the cochlea, that is, beyond the inner ear. Mixed hearing loss is a combination of conductive

and sensorineural. Central hearing loss "results from damage to the auditory cortex or to the auditory nerve that transmits sensory information from the inner ear to the auditory cortex" (Quigley & Paul, 1984, p. 3), and may occur separately, or in combination with sensorineural and neural impairment (Bess & McConnell, 1981).

Demographic Information

The primary source for demographic information on American hearing-impaired children is the Annual Survey of Hearing-Impaired Children and Youth, published by the Gallaudet College Center for Assessment and Demographic Studies (formerly, Office of Demographic Studies). Unfortunately, there is no comparable Canadian survey or agency. According to the Canadian Coordinating Council on Deafness (personal communication, July 14, 1986), there is one study nearing completion: the McGill Study on Deaf Children in Canada (MacDougall, in press), and a Disability Survey to be conducted by Statistics Canada during the Summer and Fall of 1986.

Annually, the April issue of the American Annals of the Deaf lists schools for the deaf and classes for the hearing-impaired in Canada and the United States, and the number of students attending these programs, but no additional demographic information is given.

The latest demographic report on Canadian school-aged hearing-impaired children was collected by the Gallaudet College Office of Demographic Studies in 1979 as part of its Annual Survey, and reported

in Highlights of the Canadian Survey of Hearing Impaired Children and Youth, Spring, 1979 (Karchmer, Petersen, Allen, & Osborn, 1981). In this survey, of the 4,083 students reported, "over 95% . . . receiving special education services in Canada during the 1978-79 school year were individuals with significant hearing impairments incurred prelingually, i.e., before age 3; over 70% had losses exceeding 70 dB in the better ear. Only British Columbia showed a pattern clearly different from the national norm. Almost half of the students reported from this province had hearing thresholds less than 70 dB in the better ear" (Karchmer et al., p. 2).

At the time of the study, the largest number of hearing-impaired students in Canada was in the 13 to 15 year-old age group; this was due to the maternal rubella epidemic of 1964. Aside from maternal rubella, the second highest reported cause of deafness at birth was heredity (11.9%). Meningitis was cited as the most frequent cause of deafness after birth (5.9%). While the etiological pattern was the same for both Canadian and American children, the percentage of cases for whom etiology was either unknown and/or unavailable differed: Canadian, 53.4%; American, 40%. In the 1978-79 school year, for both Canada and the United States, approximately 30% of the hearing-impaired students had additional handicaps. This proportion has remained constant (Karchmer, 1985). The most frequently cited additional handicaps include: emotional-behavioural problems (7.5%), learning disabilities (6.8%), visual problems (3.6%), cerebral palsy (3.4%), and mental retardation (3.3%).

Of the students reported in the survey, only 2.6% had two deaf parents, and 1.8% had one hearing and one deaf parent; the U.S. figures for the 1978-79 school year were almost identical: 2.6% and 1.5%, respectively.

Language Development

Language has been defined as "a code whereby ideas about the world are represented by a conventional system of signals for communication" (Bloom & Lahey, 1978, p. 4). For hearing persons, the conventional mode for communicating language is the spoken work. But for many hearing-impaired persons, especially those whose hearing loss is profound (> 90 dB), language is often communicated by means of a system of grammatically structured, conventionalized gestures, that is, sign language (Quigley & Paul, 1984). Many with severe hearing losses (70-90 dB) also use this form of communication.

In North America, the most common signing systems are: American Sign Language (ASL), Manually Coded English (MCE), and fingerspelling. The characteristics, advantages, and disadvantages of each of these systems is discussed fully by Quigley and Paul (1984).

A hearing child normally acquires language, with little effort, from his/her parent(s), and/or primary caregivers, through hearing, imitation, and interaction. Childhood language acquisition presupposes the existence of a system of fluent communication shared by the child and his/her primary caregivers. In the case of a hearing child with

hearing parents, this system is the spoken word; for a hearing-impaired child with hearing parents, this often means a manual or manual-oral communication system.

Given a normal development, a hearing child, by the time s/he begins school (5 to 6 years of age), has a receptive and expressive vocabulary of about 2500 words, speaks in complete sentences, and uses all parts of speech, though s/he may still make grammatical errors. In contrast, the extent of language facility a hearing-impaired child has upon school entry is dependent upon the severity of hearing impairment, the use of hearing aids, the communication system used between parent(s) and child, and the extent to which the child has participated in structured language situations, such as parent-infant and pre-school programs (Bess & McConnell, 1983).

IQ

For both hearing and hearing-impaired children, an IQ test is usually included in educational assessments in order to obtain some estimate of a child's present cognitive functioning, profiling both strengths and weaknesses, and to provide some indication of his/her learning potential (Salvia & Ysseldyke, 1985; Sattler, 1982).

For hearing-impaired children, the most appropriate IQ measure is one which is individually administered, and nonverbal in content (Sattler, 1982). For the hearing-impaired, the most commonly used measures of intelligence, in descending order of frequency, were found by Levine (1974) to be: the WISC-R (1974), the Hiskey-Nebraska Test of

Learning Aptitude (1966), the Leiter International Performance Scale (LIPS) (1969), the Snijders-Oomen Non-Verbal Intelligence Tests for Deaf and Hearing Subjects (1970). The Raven's Matrices (1956) was also among the top ten. The four measures used in the present study were: the WISC-R Performance Scale, the WAIS-R Performance Scale, the LIPS, and the Raven's.

While the WISC-R was cited as the most frequently used measure, the Verbal Scale is usually not administered to hearing-impaired subjects because it is thought that this would be measuring only language deficiencies (Sullivan, 1982). However, some authors (Geers, Kuehn, & Moog, 1981; Sattler, 1982) believe that the Verbal IQ (VIQ) can be used to provide an indication of the hearing-impaired child's degree of mastery of verbal concepts, and that the difference between the Performance IQ (intellectual potential) and the Verbal IQ (verbal achievement) can be used to estimate the child's progress in an educational program (Geers, Kuehn, & Moog, 1981).

Different mean WISC-R Performance IQs (PIQs) have been observed for different hearing-impaired samples. Table 5 summarizes these findings.

Table 5

Mean Performance IQs for Hearing-Impaired Samples

		Mean WISC-R PIQ	Sample Age Range	Etiology	n
Anderson & Sisco, 1977		96	Unreported	Unreported	1228
James, 1984		92	6-11	Unreported	34
Ray, 1979		99	Unreported	Unreported	127
Sullivan, 1982	(A)	98	6.4-12.4	Unreported	12
	(B)	104	Unreported	Genetic (33%) Multihandicapped (33%), Questionable[a] (33%)	45
Watson, Goldgar, Kroese, & Lotz, 1986		105[b]	7.6-18.10	Genetic (19%), Nongenetic (27%), Unknown (55%)	53

[a]Questionable: i.e., same etiologies as multihandicapped, but not exhibiting associated learning problems

[b]Ss under 16 were administered the WISC-R (77%);
Ss over 16 were administered the WAIS (23%).

It should be noted that the mean PIQs reported in these studies all fell within the Normal range (90-109) established for hearing children (Wechsler, 1974). The differences in findings may be due to the use of a variety of communication modes in administering the test, and to the fact that the hearing-impaired are not a homogeneous group.

Within any given sample of hearing-impaired there are variations in degrees of hearing loss, etiology, familial pattern of deafness, and

mode of communication used. The studies cited above may have controlled for some or none of these factors.

The communication mode used in administering the WISC-R Performance Scale to hearing-impaired subjects has been found to affect obtained IQ scores. In two separate studies, Sullivan (1982) investigated the effects of three administration modes--pantomime, visual aids, and Total Communication--on Performance IQ. In both studies, the mean PIQ obtained when the test was administered using Total Communication was 5 to 14 points higher than when administered using pantomime or visual aids. Sullivan concluded that "the regular WISC-R norms (mean 100 and standard deviation 15) may be employed when Total Communication is the appropriate administration mode" (Sullivan, 1982, p. 787).

In several studies, the mean PIQ on the WAIS, WISC, and WISC-R, for deaf children with deaf parents (DC/DP), i.e., genetically deaf, was found to be 5-11 points higher than for deaf children with hearing parents (DC/HP) (Karchmer, Trybus, & Paquin, 1978; Kusché, Greenberg, & Garfield, 1984; Sisco & Anderson, 1980; Sullivan, 1982).

Researchers have suggested that differences between DC/DP and DC/HP may be due to the early use of manual communication in families of DC/DP (Brill, 1969; Meadow, 1967; Vernon & Koh, 1970), "greater isolation, less acceptance, poorer parent-child communication, and . . . greater tendencies toward psychological and behavioral disorders" for DC/HP (Sisco & Anderson, 1980, p. 928); the presence of deaf role models for DC/DP, and the lack of same for DC/HP (Bess & McConnell, 1981; Meadow,

1980); and/or genetically based superiority in DC/DP for visual-spatial abilities (Kusché et al., 1983).

Conrad and Weiskrantz (1981) have criticized the DC/DP superiority studies on the basis that, in the samples studied, DC/DP were overrepresented while DC/HP were underrepresented. They contended that, had there been equal numbers of genetically deaf children with hearing parents included in the samples, there might have been a smaller, or perhaps, no gap, in mean PIQ score. The issue of possible IQ difference between DC/DP and DC/HP has not yet been resolved.

IQ and Achievement

For hearing children, IQ has been found to be an effective predictor of academic achievement (Sattler, 1982), with reported average correlations of .50 (Jensema, 1980; Matarazzo, 1972). However, the IQ measures used were preponderantly verbal in item content, or included both verbal and nonverbal items. Reported correlations between nonverbal IQ and achievement, for hearing children, are substantially lower at .33 (Zimmerman & Woo-Sam, 1972). Given this low correlation for hearing samples, there is reason to question the validity of using nonverbal IQ as a predictor of academic achievement for the hearing-impaired. Nevertheless, given the language deficits associated with hearing impairment, non-verbal instruments provide the best measure of mental ability in the hearing-impaired.

For a hearing-impaired sample, Hirshoren, Hurley, and Kavale (1979) reported a correlation range between the WISC-R Performance Scale and 7

scales of the Stanford Achievement Test--Hearing Impaired Edition (SAT-HI) of .09 to .35, with most of the correlations being significant. Watson et al. (1986) reported a correlation range between WISC-R Performance Scale and 5 SAT-HI scales of .12 to .53, three correlations of which were significant. In the latter study, Spelling had the lowest correlation, while Math Computation had the highest.

Academic Achievement

On average, hearing-impaired students, compared with their hearing counterparts, are educationally delayed by four to five years (Bess & McConnell, 1981). This has been attributed to the difficulties experienced by the hearing-impaired in the acquisition of language and communication skills. These, in turn, have implications for learning to read, and reading-based learning.

In the hearing-impaired population as a whole, a plateau effect in reading level has been observed. That is, there seem to be minimal gains after the age of nine or ten. Myklebust (1964), and Wrightstone, Aranow, and Muskowitz (1963) found that the average gain in reading level between ages 10 and 16 was less than one year; for 16 year olds, the mean grade level in reading was 3.5. "Profoundly deaf children may be expected to be retarded by 7 to 8 years in reading vocabulary by the age of 18" (Bess & McConnell, 1981, p. 136).

A national testing program carried out by Gallaudet College in 1971 (Bess & McConnell, 1981) studied achievement of hearing-impaired

students on the SAT-HI. The subtests are Vocabulary, Reading Comprehension, Mathematics Concepts, and Mathematics Computation. It was found that children with less severe degrees (< 70 dB) of hearing impairment surpassed those in the severe to profound (> 70 dB) range in all areas of measurement that involved language proficiency, such as Paragraph Meaning and Vocabulary. However, on those subtests requiring knowledge of spelling, punctuation, capitalization, and arithmetic computation, students with severe to profound hearing impairment surpassed those with milder degrees of hearing loss. Bess & McConnell (1981) attribute these results to the fact that the latter subtests "are less dependent on high reading comprehension levels, and students can study such tasks independently from their textbooks, relying on visual input and memory" (p. 141).

On the SAT-HI, Reading Comprehension is reported to be the most difficult for the hearing-impaired. In turn, poor reading comprehension was found to contribute to learning difficulties.

In the 1977 (United States) national testing program, Jensema and Trybus (1978) examined the relationship between communication patterns used in the home and at school, and achievement, using the SAT-HI. Jensema and Trybus found that, for all familial patterns of deafness, the most frequent communication pattern employed at home was speech alone or in combination with other modes; while at school, the most frequent pattern was a combination of speech, signs, finger spelling, writing, and gestures (i.e., Total Communication). Despite the differences in communication mode used at home and at school, mode and

pattern of communication accounted for only a small part of the difference in test scores between those who used audition and speech, and those who did not. As in the IQ studies, differences in scores were found between DC/DP and DC/HP, with DC/DP surpassing their DC/HP peers. However, Jensema and Trybus believe that this difference is not due solely to the early development of manual communication in the DC/DP, but to some other as yet undetermined variable(s).

Giftedness in the Hearing-Impaired

In the most comprehensive study to date of the gifted hearing-impaired, the Texas School for the Deaf Talented and Gifted Project (1980), it was found that "normal and slow-learning deaf students were receiving the benefits of a great deal of energy and resources, while gifted deaf students were virtually ignored" (p. 4). To say that there is a paucity of literature on giftedness in the hearing-impaired is an understatement. Undoubtedly, this is related to the practice within special education of having programs concentrate on a single form of exceptionality. This system of education tends to simplify the selection, teaching, and administrative processes, but does not address the issue of giftedness in disabled students.

Gifted Programs for the Hearing-Impaired

The foregoing review of the literature underscores the complexity of identifying giftedness in the hearing-impaired. An auditory deficit

has varying degrees of impact on the development of language and language-based learning.

Identifying giftedness in the hearing-impaired is in its infancy. With only the literature on giftedness in hearing children to guide them, educators of the hearing-impaired must now develop a body of literature relating to the hearing-impaired. To date, three programs dealing with giftedness in the hearing-impaired have been found; all of them deal with the identification process. The identification criteria used in each study are summarized in Table 6.

Thus, each of the three programs is based on multiple criteria, with an emphasis on cognitive and academic giftedness. In addition, the Texas School for the Deaf includes a measure of creativity, but only for ages 6 - 14.

Gifted Hearing-Impaired: Characteristics

From the minuscule amount of literature on the gifted hearing-impaired, it seems that they share many of the characteristics with their hearing peers. In addition to those characteristics listed in Table 1.2, Whiting, Anderson, and Ward (1980) noted that the intellectually gifted hearing-impaired students in their study were working at grade level, whereas most of their hearing-impaired chronological peers were usually working below grade level. Given that language deficits are common among the hearing-impaired, it is the rule rather than the exception for hearing-impaired students to be functioning below the grade level appropriate to their age.

Table 6.

Criteria for Identifying Giftedness in the Hearing-Impaired

Institution	Criteria
Covina-Valley Unified School District, CA. (Whiting, Anderson, & Ward, 1980)	- Screening and nominating form - Upper 2% on individualized IQ test - Other diagnostic tests as required
Gallaudet College, Washington, DC. Young Scholars Program (personal communication, 1986)	- At or above grade level in Reading, Math, Science - IQ test: cutoff score not specified - Teacher recommendation - Student essays

Texas School for the Deaf, Austin, TX. (1980)

Age	Predictor Measure	CutOff Score
6 - 11	Raven's Standard Progressive Matrices	77th %ile
	Torrance Tests of Creative Thinking (Figural only) Creativity Index	99th %ile
12 - 14	SAT-HI Composite Math Score[a]	303
	Torrance Tests of Creating Thinking (Figural only) Creativity Index	89th %ile
15 - 21	SAT-HI Composite Math Score[a]	347
	Raven's Standard Progressive Matrices	44th %ile

[a]SAT-HI Composite Math Score is the sum of the student's scaled scores on the SAT-HI Math Computation and Math Concepts subtests.

Summary

Although there is no unanimity in the defining of giftedness, two definitions, and variants of them, prevail: that of the U.S. Office of Education, and that of Renzulli. The U.S.O.E. definition was used as a basis for that adopted by Alberta Education.

While there is no single characteristic or combination of characteristics which define giftedness, those listed by educators usually apply to the cognitive, affective and/or creative areas. There is general agreement that signs of giftedness are observable from early childhood, are usually present in clusters and are present to a greater extent in the gifted than in children in general.

To date, no standard procedure to identify giftedness has been developed, although there is a preference among educators for the use of multiple criteria. The identification process frequently involves the use of teacher nomination forms, IQ and achievement tests scores, tests of creativity, and evaluation of student products in the performing and visual arts.

The scant literature on giftedness in the handicapped reflects a limitation in attitude, on the part of educators, toward the achievement potential of handicapped children and points to the failure of school boards to address the issue by providing appropriate enrichment opportunities for this diverse population.

The hearing-impaired population was seen to be a heterogeneous group, differing on variables such as nature and degree of hearing loss,

etiology, language and speech proficiency. Trends in IQ and academic achievement have been observed in various subgroups of the hearing-impaired, but findings are not conclusive. Finally, it was noted that, to date, little work has been done on identifying giftedness in the hearing-impaired, and on developing appropriate programs for the gifted hearing-impaired.

CHAPTER THREE

METHODOLOGY

Introduction

The study on which this thesis is based was part of a broader investigation of gifted hearing-impaired students, the main objectives of which were to identify gifted hearing-impaired children in Edmonton, Alberta between the ages of 6 and 16, and to develop instruments and procedures which could be used by teachers to identify these children. Using the student population at the Alberta School for the Deaf (ASD) in Edmonton, the present study focussed on the relationship between IQ and characteristics of giftedness as delineated by four nomination forms.

Subjects

The initial sample consisted of two groups (N=32), 16 students each, ages 5-7 to 20-4. Group I consisted of 16 students nominated by teachers. One subject was dropped from the study because hearing loss was less than the cutoff of 70 dB, leaving 15 subjects.

Group II, initially consisting of 16 age-matched subjects, was selected by the researcher to serve as a comparison group. The decision to match on the basis of age was intended to control for developmental factors and academic level. Two sets of nomination forms in Group II were not returned, leaving 14 subjects. This meant that for two

subjects in Group I, there were no age matches, and for one subject in Group II, there was no corresponding nominee. The final sample thus consisted of 29 subjects: 15 in Group I, and 14 in Group II.

Of the 13 subjects in Group I with age matches, 12 had age matches within six months of each other (for eight, the age matches were within two months of each other; for four, the age matches were within six months), while there was one subject with a 19-month difference. In order to protect the identity of subjects, a table of individual age matches is not included, but a summary of the age groups is given in Table 7.1.

Table 7.1

Age Groups Represented

Age Groups	Group I	Group II
5-7 - 11-1	8	8
12-0 - 14-11	3	2
15-0 - 20-4	4	4
	n = 15	n = 14

Tables 7.2 and 7.3 summarize the demographic data for both groups in the study.

Table 7.2

Sex, and Familial Pattern of Hearing Impairment

Sex	Group I	Group II
M	9	6
F	6	8
Familial Pattern		
DP2	9	0
HP2	5	11
Unknown	1	3
	n = 15	n = 14

DP2 = 2 deaf parents
HP2 = 2 hearing parents
Unknown = hearing status of family of origin unknown

From Table 7.2, it can be seen that for Group I, the majority of subjects had two deaf parents. In contrast, the majority of Group II subjects had hearing parents. Thus Group I subjects tended to come from families in which hearing impairment was hereditary, whereas, Group II subjects, whose hearing impairment was largely due to adventitious causes, tended to be from hearing families.

As can be seen from Table 7.3, all subjects in the study were prelingually hearing-impaired, the majority being profoundly deaf (HL > 90 dB). In Group I, etiology was primarily hereditary in nature, and, to a lesser degree, due to unknown causes, as well as to identified adventitious causes such as viral infections, pneumonia, and scarlet fever. In Group II, the causes of the hearing impairment were evenly divided between adventitious and unidentified/unreported causes. For

Table 7.3

Hearing Status and Etiology of Hearing Loss

Pure-Tone Average HL in Better Ear	Group I[a]	Group II[b]
70 - 79 dB	0	1
80 - 89 dB	1	2
90+ dB	14	11
Etiology of HL		
Hereditary	7	0
Adventitious	3	7
Unknown	5	7
Age At Onset		
Birth - 2 years	15	14
Type of HL		
Sensorineural, bilateral	15	13
Mixed, bilateral	0	1

[a] n = 15

[b] n = 14

Group II, adventitious causes included: maternal toxemia during pregnancy, anoxia at birth, meningitis, and maternal rubella. With the exception of one subject in Group II, all subjects in the study had a bilateral, sensorineural hearing loss.

All subjects in the study were in attendance at the Alberta School for the Deaf (ASD) during the 1984-85 school year. ASD, operated by Alberta Education, offers schooling from Kindergarten through Grade 12, for ages 3 to 18+, primarily for students who are profoundly deaf

(HL >90 dB), and/or whose hearing loss is such that it "impairs their functioning in a regular classroom" (Alberta School for the Deaf, 1984, p. 6). Although services are for Alberta residents, the school does occasionally accept non-Alberta residents. Prerequisites for admission to the school are two-fold: audiological and speech assessments conducted by either ASD or another agency, and approval of the student's school jurisdiction. The school population for the 1984-85 school year was 124.

With respect to mode of communication, ASD has adopted a policy of Total Communication; that is, any combination of aural, manual, oral, and/or written language.

Design

The study was primarily descriptive because its purpose was to examine and describe an existing phenomenon--giftedness in the hearing-impaired--and, from the collected data, to search for relationships and generate hypotheses (Ary, Jacobs, & Razavieh, 1985; Galfo, 1983; Isaac & Michael, 1979).

Three types of techniques were used to accomplish these ends: questionnaires, structured interviews, and correlation. Correlations and *t*-tests were calculated in order to test the following hypotheses:

Hypothesis 1: There is a significant difference in mean IQ between Groups I and II.

Hypothesis 2: For the nominated group (Group I), but not for the comparison group (Group II), there is a significant relationship between IQ and each of the nomination forms.

Hypothesis 3: There is a significant difference between the means of Groups I and II on each of the nomination forms.

Hypothesis 4: There is a significant relationship among the four nomination forms for each of Group I and Group II.

Instruments

Because of the absence of instruments to assess giftedness in the hearing-impaired, considerable deliberation preceded the final selection of nomination forms.

The four forms were selected because of their complementarity in style, content and length. However, there was a certain amount of overlap in content. Of the four forms, the SRBCSS was the longest and most detailed (ten pages), while the other three were single-page forms. Copies of all four forms are included in Appendices A to D.

Scale for Rating Behavioral Characteristics of Superior Students (SRBCSS) (Renzulli, Smith, White, Callahan, & Hartman, 1976)

Consisting of 10 scales, with a total of 95 items, this form is the most extensive of its kind, and one of the few normed measures of giftedness available. The items were derived from a comprehensive review of the literature on characteristics of superior students. For

an item to be included on the SRBCSS, the characteristic it represented had to have been recognized as important in at least three separate studies (Barbe & Renzulli, 1981). The SRBCSS was chosen for use in this study because, of the nomination forms available, it is the most detailed in breadth and depth. Table 8 lists the ten scales, the abbreviation which will be used in the reporting of results, and the number of items per scale.

Table 8.

Scales for Rating the Behavioral Characteristics of Superior Students

Scale	Number of Items
Learning Characteristics (Learn)	8
Motivational Characteristics (Motiv)	9
Creativity Characteristics (Creat)	10
Leadership Characteristics (Lead)	10
Artistic Characteristics (Art)	11
Musical Characteristics (Music)	7
Dramatics Characteristics (Drama)	10
Communication Characteristics--Precision (Comm-P)	11
Communication Characteristics--Expression (Comm-E)	4
Planning Characteristics (Plan)	15
Total:	95

Each item was rated on a four-point scale:

1 Seldom or never

2 Occasionally

3 Considerably

4 Almost always

Totals were calculated for each scale, and for all scales combined.

Reported test-retest reliability for the SRBCSS ranged from .91 to .77, with a mean of .84. Reported inter-rater reliability ranged from .89 to .67, with a mean of .83.

Rating Gifted Students (RGS) (Edmonton Public School Board, 1985)

Now titled Academic Challenge Program Rating Scale, this 15-item instrument is used by the Edmonton Public School Board (EPSB) as a screening tool to identify academically gifted students. A student's total score on the RGS accounts for 20% of the Total Weighted Score (Ability, 40% + Achievement, 40% + Rating Score, 20%) on an Identification Matrix (Edmonton Public School Board, 1985).

Devised by EPSB staff, this instrument draws heavily from the following SRBCSS scales: Learning, Motivation, Creativity, Artistic, and Planning. Although designed as a five-point rating scale, in the present study, for the sake of consistency in scoring among the four questionnaires, the same four-point scale used in the SRBCSS was adopted. Reliability and validity for this measure have not been established. The RGS was chosen because of its focus on identifying the academically gifted student.

Teacher Observational Items (TOI) (Pledgie, 1982)

This seven-item questionnaire, rated on the four-point scale, was intended as an initial screening tool to identify gifted handicapped students. After examining checklists and lists of characteristics

pertaining to four groups of children: the gifted, culturally-diverse gifted, disadvantaged gifted, and handicapped gifted, Pledgie selected the seven behaviours common to all four groups. Reliability and validity data for this instrument have not been reported. The TOI was selected for use in the present study because of its emphasis on identifying gifted handicapped students.

Nomination Form for Potentially Gifted Students (NFPGS) (Nasca, 1980)

This nine-item questionnaire, rated on the four-point scale, was developed in an effort to identify gifted students who might otherwise be missed by group testing; that is, those who underachieve, exhibit disruptive, withdrawn and/or other deviant behaviour. As indicated in the literature review, disruptive behavior is not uncommon among gifted students. No reliability or validity data are reported for this measure. The NFPGS was selected for use in this study because of its contribution to the identification of underachieving gifted.

IQ Test Scores

IQ scores used in the data analysis for this study were collected from school files. IQ tests for all subjects (N=29) had been conducted 1 month to 26 months prior to data collection: 18 of them in the 12 months prior to data collection; 11 of them in the 13 to 26 months prior to data collection.

Four different IQ measures were in use at the time of data collection: the WISC-R, the WAIS-R, the Leiter International

Performance Scale (LIPS), and the Raven's Standard Progressive Matrices (Raven's). Table 9 summarizes the frequencies for this study, for each of these intelligence tests.

Table 9.

Frequencies of Four Intelligence Tests Used

Test	Group I	Group II
WISC-R Performance Scale	6	5
WAIS-R Performance Scale	0	1
LIPS	4	6
Raven's	5	2
	n = 15	n = 14

The lack of standardization in choice of IQ test at the Alberta School for the Deaf appeared to be a function of personal choice of the psychologist, together with the age limitations imposed by each of the tests, as well as the attention span of individual students. The WISC-R Performance Scale and the Leiter were used for ages 5 to 16, while the Raven's was the test of choice for students 16 and over.

According to the school psychologist, both the WISC-R and the Raven's were administered using Total Communication. The LIPS was administered, as directed in the manual, in mime. Adjusted scores (five is added to the total score) were reported for the LIPS. Hearing norms were used with all instruments (D. Hart, personal communication, April 17, 1985).

Procedure

After permission to conduct the study was obtained from the Director of the Alberta School for the Deaf, letters were sent to parents of all ASD students requesting permission for their child's/ children's participation in the study, including testing, use of information in the school files, and of information from school personnel.

A meeting was held with all ASD teachers to orientate them to the project, and to solicit their help in nominating potentially gifted students at ASD with a hearing loss greater than 70 dB. Concerning giftedness, teachers were told that it usually comprises the top 3-5% of students in any given population. They were asked to nominate any students, whether in their class or someone else's, whom they thought might be gifted, and were advised to nominate even those students about whose giftedness they were uncertain, so as to miss as few eligible students as possible. When rating, teachers were requested to compare the nominees with their hearing-impaired peers.

Teachers were then given a set of the four nomination forms for each nominee. Follow-up notes were sent and phone calls were made to encourage teachers to return the forms.

After all the nomination forms were received, for each nominated student the author completed a data sheet (included in the Appendices) using the most recent information available in the school files. In some cases, information was verified and augmented by school personnel.

Collected data included: etiology and type of hearing impairment, familial pattern of hearing impairment, pure-tone average hearing loss in the better ear, IQ and achievement test scores, grades from report cards, and additional teacher comments relating to the student's school performance.

The nominee ages were tabulated as of March 31, 1985, and age-matches (Group II) were then selected from a list of all unnominated students.

Data sheets identical to those used for the nominees were then completed by the author for each of the age-matches. Homeroom teachers were then asked to complete the four nomination forms for each of these subjects. These teachers were asked to rate each subject on the characteristics present on the nomination forms.

After all forms had been returned, and using the Teacher Interview Schedule (included in the Appendices), an interview was conducted with the rater of each nominee to elicit their comments concerning the nature of giftedness in the hearing-impaired generally, and specifically in the student/s they nominated. Teachers were also asked for their comments and criticisms concerning the four nomination forms. The collection of these data was to supplement the statistical analysis of the study, and to aid in the development of a nomination form appropriate for use with the hearing-impaired.

Because it was assumed that the age-matched subjects would not be gifted, interviews were not conducted with the raters of these subjects.

CHAPTER FOUR

RESULTS AND DISCUSSION

Results

Unscored Items

Prior to data analysis, all four forms were inspected for unscored items, and, through teacher interview, an attempt was made to ascertain the reason(s) for which specific items were left unscored. From the teacher interviews, it was learned that failure to score an item could mean that either the characteristic was inapplicable to deaf students generally, and/or the rater lacked sufficient knowledge about the nominee on a particular characteristic. In most instances, leaving an item unscored was due to the first reason. Items for which the second reason applied tended to be those which asked about the nominee's extracurricular activities and interests (e.g., RGS item number 7, "Becomes motivated in a topic, carries interest to independent afterschool activities"), or curricular activities in which the homeroom teacher was not involved with the student (e.g., sports).

One of the purposes for using the chosen nomination forms with a hearing-impaired sample was to discover which of the items would be applicable to potentially gifted hearing-impaired children. To achieve this purpose, an item-by-item tally of unscored items was done. Because

only the nominees (Group I) were thought to possess characteristics of giftedness, the discussion of unscored items will be limited to Group I subjects. The bar graph in Figure 1 summarizes the distribution of unscored items for each group, for each of the ten SRBCSS scales, the total SRBCSS, the RGS, TOI, and NFPGS. The supporting data for Figure 1 are given in Table 10.

The percentages were calculated by dividing the total number of unscored items for all Group I subjects (n=15) by the total possible number of scores for all Group I subjects (number of items x n), and multiplying by 100. Thus, Figure 1 presents the percentage of unscored items for each SRBCSS scale, and for each nomination form overall. Item-by-item tallies for each scale and form are included in Appendix G. T-tests revealed that there were no significant differences in the percentage of unscored items for Groups I and II except for the Learning Scale of the SRBCSS (t_{obs}=3.33; t_{crit}=2.05; $p < .05$), and the RGS (t_{obs}=-3.0; t_{crit}=2.05; $p < .05$).

SRBCSS

On the SRBCSS, there were four scales in which the percentage of unscored cases was notable: Musical, Planning, Communication-Precision, and Artistic. Of all the SRBCSS scales, the Musical Characteristics Scale, as a whole, contained the highest percentage of cases with unscored items (46.7%). That is, across all seven items, 46.7% of the cases were unscored. Item-by-item inspection revealed that, for each

Figure 1

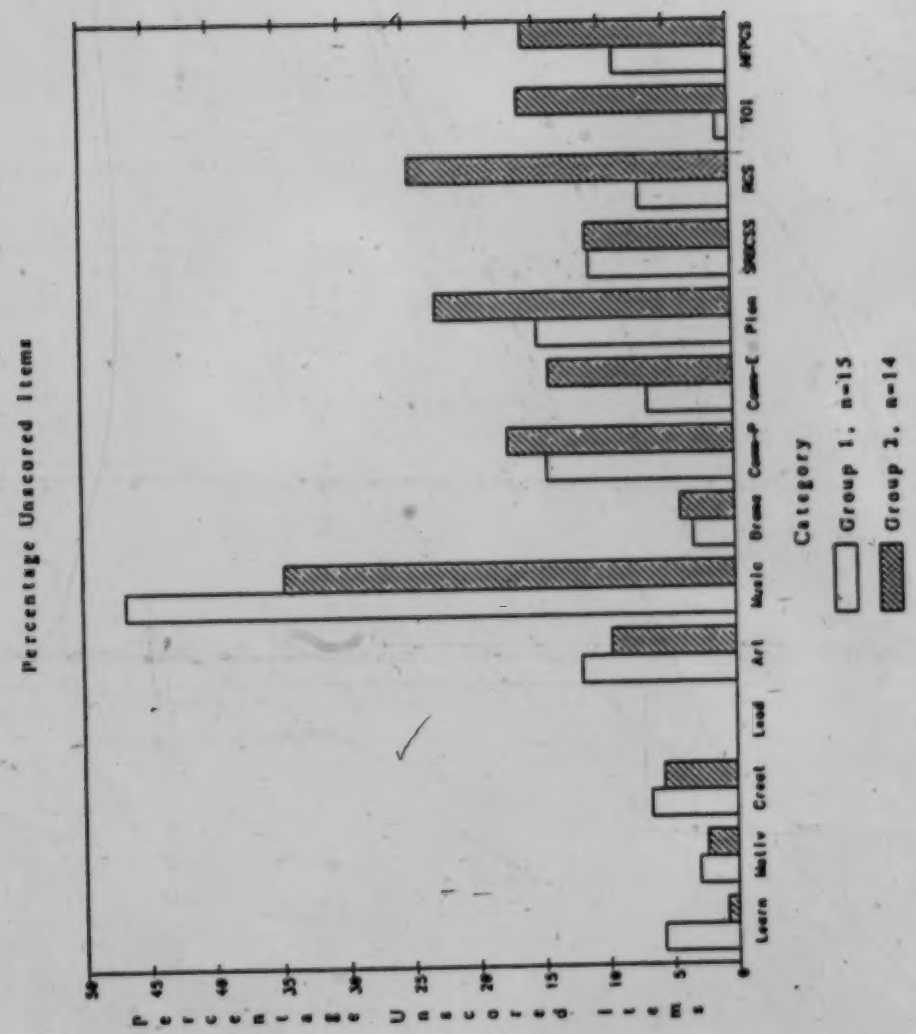
Percentage Uncored Items
Percentage Uncored Items
50
45
40
35
30
25
20
15
10
5
0
Learn
Motiv
Creat
Lead
Art
Music
Drama
Comm-P
Comm-C
Plan
SUCCESS
RCS
TOI
MTPCS
Category
Group 1, n=15
Group 2, n=14

Table 10.

Data for Unscored Items

Form	No. Items	Group I (n=15) Total Possible Scores[a]	Group I (n=15) No. Unscored	Group I (n=15) %	Group II (n=14) Total Possible Scores	Group II (n=14) No. Unscored	Group II (n=14) %
SRBCSS							
Learn	8	120	7	5.8	112	1	.9
Motiv	9	135	4	3.0	126	3	2.4
Creat	10	150	10	6.7	140	8	5.7
Lead	10	150	0	0.0	140	0	0.0
Art	11	165	20	12.0	154	15	9.7
Music	7	105	49	46.7	98	34	34.7
Drama	10	150	5	3.3	140	6	4.3
Comm-P	11	165	24	14.5	154	27	17.5
Comm-E	4	60	4	6.7	56	8	14.3
Plan	15	225	34	15.1	210	48	22.9
SRBCSS	95	1425	157	11.0	1330	150	11.3
RGS	15	225	16	7.1	210	52	24.8
TOI	7	105	1	1.0	98	16	16.3
NFPGS	9	135	12	8.9	126	20	15.9

[a] Total possible scores = n x number of items

item, five to eight cases were left unscored; that is, the items were deemed to be inapplicable to the nominee. The inapplicability of Musical Characteristics to these nominees is, undoubtedly, directly related to the fact that all of them were profoundly deaf (HL > 90 dB).

On the Planning Characteristics Scale, 15% of the items were unscored. All items except number seven, "Is good at games of strategy where it is necessary to anticipate several moves ahead," had unscored cases. This is indicative of some variation within the nominated group in characteristics such as organization, breaking a task into substeps, and relating an individual step to the whole process.

The Communication Characteristics--Precision Scale, on which 14% of the items were unscored, included characteristics such as clarity and precision in written and oral expression, ability to express ideas in alternate ways, and degree of descriptiveness. The fact that items in this area were thought to be inapplicable to some nominees is possibly due to the language-related problems found among deaf individuals.

For hearing-impaired persons who communicate with sign language, precision of expression can be sacrificed because in sign language, which is grammatically different from English, individual signs can be used to express an entire idea, or to signify one of several words. For example, the same sign can mean "different," "differ," "diverse," "unlike," or "varied," depending on context. Secondly, hearing-impaired persons, especially those who were deaf prelingually, have lacked the usual opportunities to learn the subtleties of English, which are often communicated orally by both choice of word and inflection. The only

item on the Communication-Precision scale which was thought to be applicable to all nominees was number seven, "Can find various ways of expressing ideas so others will understand." This observation, supported by teacher comment, indicates that, while these potentially gifted hearing-impaired students might lack the conventional language skills to enable precise communication, whether or not attributable to the imprecision of sign language, when it is important to them to communicate with clarity, they use alternate means, such as fingerspelling or writing.

The fourth scale which merits discussion is the Artistic Characteristics Scale, on which 12% of the items were unscored. Only item number 1, "Likes to participate in art activities; is eager to visually express ideas," was regarded as applicable to all 15 nominees. The failure to score items on this scale is possibly a reflection of the lack of curricular opportunity for involvement in art rather than a lack of talent in this area.

From the foregoing discussion, it is apparent that, for this group of nominees, characteristics perceived as inapplicable, or those found difficult to evaluate, were associated mainly with the areas of planning, musicality, precision of communication, and art.

In contrast, it can be seen from Figure 1 and Table 10 that the remaining scales of the SRBCSS contained smaller percentages of unscored items, indicating larger proportions of items perceived as relevant and, perhaps, found easier to evaluate. In order of increasing percentages

of unscored items, the scales were: Leadership (0% cases with unscored items), Motivation (3%), Drama (3.3%), Learning (5.8%), Creativity, and Communication-Expression (each, 6.7%). An implication of these findings is that characteristics from these six areas may be those most relevant to assessment of academic giftedness in the hearing-impaired as well as those which are the easiest to evaluate in this population.

For the three remaining forms: Rating Gifted Students (RGS), Teacher Observational Items (TOI), and Nomination Form for Potentially Gifted Students (NFPGS), the percentages of unscored items, in ascending order, were: TOI (1%), RGS (7.1%), NFPGS (8.9%). Because each of the forms contained some characteristics not shared by the other forms, the percentages do not necessarily reflect the relative relevance (i.e., most, least) of the forms to the hearing-impaired. It is probably more useful to note from each form those characteristics which were found to be relevant to the nominees, and use these data in the construction of a single form for use with this population.

TOI

On the TOI (1% of cases with unscored items), the shortest of the forms, six of the seven items were perceived by teachers as relevant to all nominees and/or capable of being readily evaluated. Only item number six, "Has many interests," was found to be difficult to evaluate for one nominee. The characteristics evaluated by the TOI were: vocabulary, memory, understanding of cause and effect, divergent thinking, attention span, curiosity, and humour.

RGS

As pointed out in Chapter III, all 15 of the RGS items were based on those found on the following five SRBCSS scales: Creativity (RGS item numbers 1, 2, 3, 4, 6 and 15); Motivation (RGS item number 7, 8, 9, 11, and 13); Learning (RGS item numbers 5, 12, and 14); Planning (RGS item numbers 9 and 10); and Artistic (RGS item number 6). The purpose of the RGS is to identify academically gifted students. Overall, on the RGS, 7.1% of the items were unscored. Items which were thought to be relevant to all nominees were those which dealt with curiosity (number 1), generation of alternative ideas (number 2), observational skills (number 5), initiative and ability to work independently (number 8), realistic goal setting (number 9), persistence in task completion (number 11), and quickness to grasp principles and make generalizations (number 13).

NFPGS

The NFPGS was designed to identify gifted underachievers and/or gifted culturally diverse students by alerting teachers to a positive connotation of characteristics which are often viewed negatively (e.g., "Is bored with traditional courses of study," "Withdrawn, yet capable when pressed"). Overall, 8.9% of the items were unscored. There were three items which were thought to be applicable to all nominees or which the raters thought they could appropriately evaluate: number 3, "Has

extensive knowledge in some out-of-school oriented topic;" number 7, "Withdrawn yet capable when pressed;" and number 9, "Fails to complete homework but appears extremely capable."

Because each of the four nomination forms used in this study was designed for a different purpose, each appears useful in contributing ideas relevant for use with the hearing-impaired. Ultimately, the decision to include or exclude an item will depend on the aspect/s of giftedness which a school or school board wishes to investigate.

IQ Data

The use of four different intelligence tests posed some difficulties for calculations of group means and correlations. While Wechsler scales have a mean of 100 and a standard deviation of 15 (Compton, 1984), the Leiter (Adjusted Scores) has a mean of 100 and a standard deviation of 16 (Compton, 1984). Mean and standard deviation for the Raven's are not reported in the literature or in the Raven's manuals. Thus, for purposes of comparison, and for correlation calculations, all IQ scores were converted to percentiles, using the Sattler charts (Sattler, 1982, Table BC-1) for the Wechsler and Leiter scores, and the Raven's Manual (Raven, Court, & Raven, 1983) for the Raven's scores. The use of *z*-scores would have permitted the most accurate comparison of IQ scores, but this was not possible since neither mean nor standard deviation for the Raven's has been reported.

Nomination Scores

Of the 15 subjects in Group I, seven received one nomination, seven received two, and one received three nominations. While multiple nominations provided additional evidence of a student's potential giftedness, for the purpose of the statistical analyses, it was necessary to use only one set of scores, so that of the homeroom teacher was used. This was based on the assumption that this teacher would have had the most opportunities to observe the nominee in a variety of situations.

Analysis of Data

Because some items were left unscored, for reasons previously discussed, the decision was taken to analyze the data twice: once assigning a value of 0 to each unscored item, and once assigning a value of 1. There were only slight differences in the results. However, it was decided to utilize the data in which a value of 1 was assigned to unscored items because all cases would be included in the calculations, and the results would, then, be representative of all subjects in the study.

The hypotheses tested were as follows:

Hypothesis 1: There is a significant difference in mean IQ between Groups I and II.

Hypothesis 2: For the nominated group (Group I), but not for the comparison group (Group II), there is a significant

relationship between IQ and scores on each of the nomination forms.

Hypothesis 3: There is a significant difference between the means of Groups I and II on each of the nomination forms.

Hypothesis 4: There is a significant relationship among the four nomination forms for each of Group I and Group II.

Correlations and t-tests were calculated among IQ, each of the SRBCSS scales, and the totals of all four nominations forms, using the Statistical Package for the Social Sciences (SPSS-X) program. Hypotheses 1 and 3 were tested by t-tests; Hypotheses 2 and 4 were tested by the Pearson product-moment correlation at the .05 level of statistical significance.

Hypothesis 1. A t-test was conducted to determine if there was a significant difference in mean IQ between Groups I and II. Table 11.1 lists in ascending order, the IQ percentiles for the subjects in each group. There was a wide dispersion of IQ scores in each group. Group I, however, had a narrower range with a larger proportion of the scores falling at the upper end than did Group II.

The distribution of IQ percentile class intervals, for both Group I and Group II, are presented in the frequency polygon in Figure 2. The supporting data for Figure 2 are given in Table 11.2. As can be seen in Figure 2, IQ scores for Group I are negatively skewed, whereas, IQ scores for Group II are bimodal, evidence of a greater heterogeneity in

Table 11.1

IQ Percentiles, Groups I and II

Group I[a]			Group II[b]		
I.D. No.	IQ %ile	IQ Test	I.D. No.	IQ %ile	IQ Test
12[a]	45	Leiter	19	8	Leiter
1	51	Raven's	23	9	WISC-R (P)
14	60	Raven's	21	14	Leiter
10	65	Leiter	24	19	WISC-R (P)
5	74	Raven's	31	19	WAIS-R (P)
6	75	Raven's	17	29	Leiter
9	83	Leiter	32	37	WISC-R (P)
11	83	Leiter	30	50	Raven's
2	87	WISC-R (P)	20	55	Leiter
16	90	Raven's	29	55	WISC-R (P)
13	94	WISC-R (P)	22	69	Leiter
7	95	WISC-R (P)	28	71	Raven's
15	96	WISC-R (P)	26	84	WISC-R (P)
8	96	WISC-R (P)	18	96	Leiter
4	97	WISC-R (P)			
Mean:	79.4		Mean:	48.9	

[a] $n = 15$

[b] $n = 14$

Figure 2

Distribution of IQ Percentiles, Groups I and II

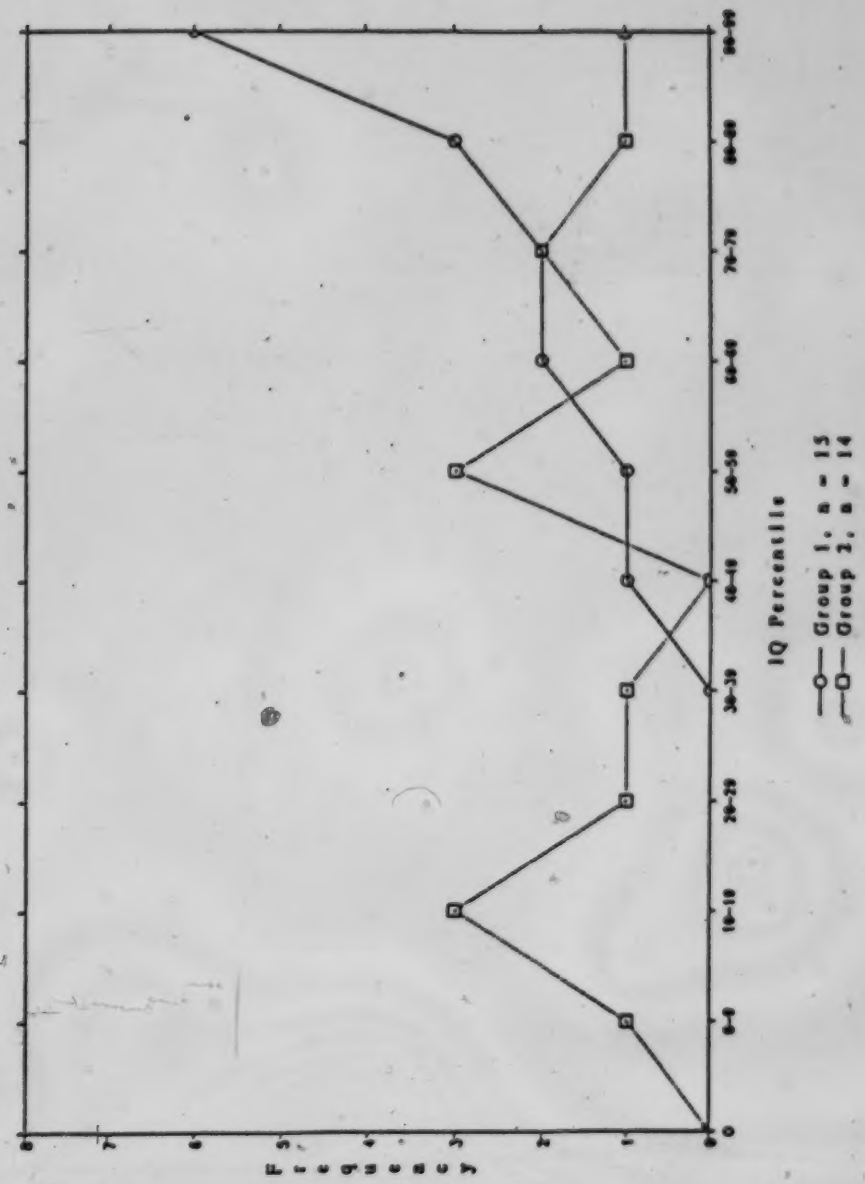

Table 11.2

IQ Percentile Class Intervals, Group I and Group II

IQ %ile Class Intervals	f	IQ %ile Class Intervals	f
40 - 49	1	0 - 9	1
50 - 59	1	10 - 19	3
60 - 69	2	20 - 29	1
70 - 79	2	30 - 39	1
80 - 89	3	40 - 49	0
90 - 99	6	50 - 59	3
		60 - 69	1
		70 - 79	2
	Total = 15	80 - 89	1
		90 - 99	1
			Total = 14

this group. The mean IQ percentile for Groups I and II are respectively, 79.4 and 48.9.

Table 11.3 presents the results of the t-test for Hypothesis 1. The results confirmed Hypothesis 1, that the mean IQ percentile for those nominated as gifted (Group I) would be significantly higher than that for the age-matched subjects (Group II).

Table 11.3

T-Test for Significant Difference Between IQ Percentile Means

	n	Percentile	S.D.	S^2	p (2-tailed)
Group I	15	79.4	.17	.03	.001
Group II	14	48.9	.28	.08	

Hypothesis 2. For Group I, it was expected that there would be a significant relationship between IQ percentile and scores on each of the nomination forms, but not for Group II. The observed correlations are reported in Table 12. The significant correlation is marked with an asterisk. Since no significant correlation was found for Group I, Hypothesis 2 was rejected for Group I. For Group II, however, Hypothesis 2 was generally accepted, since there were no significant correlations, except for the comparison between IQ percentile and the SRBCSS Planning scale. Discussion of these findings is on page 93.

Hypothesis 3. Table 13 contains the results of the t-test for Hypothesis 3, that there would be a significant difference between the means of Groups I and II on each of the nomination forms. The Table reports the mean score for each group, on each of the SRBCSS scales, the mean score for each of the four nomination forms, and the two-tailed probability that the difference in means could have occurred by chance.

The possible scores ranged from 1 (Seldom or never), to 4 (Almost always).

The results of the t-test for means confirmed Hypothesis 3, with the exception of the Musical scale of the SRBCSS. On each comparison, mean scores were higher for Group I than for Group II. The results are discussed on page 95.

Hypothesis 4. Pearson correlation coefficients were calculated among the scores for the four nomination forms to determine if any

Table 12.

Pearson Correlations Between IQ Percentile and Nomination Form Scores

	Group I[a]		Group II[b]	
	r	p	r	p
SRBCSS				
Learn	.43	.109	.17	.568
Motiv	.29	.301	-.23	.424
Creat	-.03	.928	-.20	.489
Lead	.36	.185	.25	.395
Art	-.23	.404	.33	.244
Mus	.03	.924	-.02	.953
Drama	.25	.365	.43	.126
Comm-P	.20	.483	.18	.532
Comm-E	.27	.332	.15	.612
Plan	.10	.712	.61	.021*
Total SRBCSS	.22	.431	.32	.262
RGS	.19	.487	.32	.259
TOI	.42	.124	.28	.341
NFPGS	.05	.856	.27	.357

[a] $n = 15$

[b] $n = 14$

Table 13.

Nomination Forms: T-Tests for Significant Differences Between Means

Nomination Form	Group I[a] Mean Score	S.D.	Group II[b] Mean Score	S.D.	p
SRBCSS					
Learn	3.0	.65	1.3	.34	.000*
Motiv	2.6	.34	1.3	.33	.000*
Creat	2.4	.44	1.5	.34	.000*
Lead	3.1	.44	2.0	.63	.000*
Art	2.0	.78	1.4	.34	.016*
Mus	1.1	.29	1.2	.35	.871
Drama	3.0	.52	1.9	.67	.000*
Comm-P	2.5	.78	1.2	.31	.000*
Comm-E	2.7	.68	1.8	.53	.000*
Plan	2.5	.73	1.3	.32	.000*
SRBCSS	2.5	.36	1.5	.28	.000*
RGS	.9	.55	1.5	.68	.000*
TOI	3.3	.57	1.6	.77	.000*
NFPGS	2.2	.52	1.4	.79	.002*

[a] $n = 15$

[b] $n = 14$

Table 14.1.

Pearson Correlations for Nomination Form Scores, Group I[a]

	SRBCSS	RGS	TOI	NFPGS
SRBCSS		.86	.68	.75
RGS			.85	.76
TOI				.71

[a] $n = 15$ $r_{crit} = .51$

Table 14.2.

Pearson Correlations for Nomination Form Scores, Group II[a]

	SRBCSS	RGS	TOI	NFPGS
SRBCSS		.37	.34	.21
RGS			.98	.92
TOI				.89

[a] $n = 14$ $r_{crit} = .53$

significant relationships among the forms existed in either Group I or Group II. Tables 14.1 and 14.2 report the correlations for Groups I and II respectively. Significant correlations are underlined.

For Group I, Hypothesis 4 was accepted. All four forms were highly intercorrelated; that is, each was capable of identifying potentially gifted hearing-impaired students. Of the four forms, the RGS correlated most highly with each of the other three.

For Group II, however, since only the RGS, TOI, and NFPGS were highly intercorrelated with each other, Hypothesis 4 was partially accepted. The SRBCSS did not correlate significantly with any of the other three forms. The discussion of the results for this hypothesis begins on page 96.

SRBCSS. Within the SRBCSS, for each group, correlations were calculated to see if there were any significant relationships between each of the SRBCSS scales and the total SRBCSS, and between pairs of

SRBCSS scales. The results are presented in the following five sections (pp. 77-81); discussion of the results begins on page 97.

SRBCSS: Significant Correlations with Total SRBCSS Scales. For both groups, scores on 7 of the 10 SRBCSS scales correlated significantly with the total SRBCSS scores. Of the 7 scales, 5 were common to both groups. However, the rank order and pattern of the significant correlations was different for each group. The SRBCSS subscale correlations for Group I and Group II are presented in Table 15. Significant correlations are underlined.

Table 15.

SRBCSS Subscale Correlations with Total SRBCSS

	Learn	Motiv	Creat	Lead	Art	Mus	Drama	Comm-P	Comm-E	Plan
Group I[a]	.80	.69	.71	.17	.32	-.21	.66	.80	.87	.83
Group II[b]	.76	.50	.69	.84	.85	.33	.85	.47	.63	.59

[a] $n = 15$ $r_{crit} = .51$

[b] $n = 14$ $r_{crit} = .53$

For Group I, the correlations for the 10 SRBCSS scales ranged from .87 to -.21, with an average correlation of .56. The 7 scales which correlated significantly with the total SRBCSS, in descending order, were: Communication-Expression (.87), Planning (.83), Learning (.80), Communication-Precision (.80); Creativity (.71), Motivation (.69), and

Drama (.66). The significant correlations ranged from .87 to .66, with an average significant correlation of .77.

For Group II, the correlations for the 10 SRBCSS scales ranged from .85 to .33, with an average correlation of .65. The 7 scales which correlated significantly with the total SRBCSS, in descending order, were: Art, and Drama (.85), Leadership (.84), Learning (.76), Creativity (.69), Communication-Expression (.63), and Planning (.59). The significant correlations ranged from .85 to .59, with an average significant correlation of .74.

SRBCSS Significant Interscale Correlations. From Tables 16.1 and 16.2, it can be seen that, for Group I and Group II, respectively, there were distinctly different patterns of significant interscale correlations on the SRBCSS. There were 28 significant interscale correlations for Group I, and 26 for Group II. Significant correlations are underlined. The number of significant interscale correlations for each group is given in Table 16.3.

The significant SRBCSS interscale correlations for those nominated as gifted (Group I) were found on the following 6 scales: Learning, Motivation, Creativity, Communication-Precision, Communication-Expression, and Planning. No significant relationships were found on the scales dealing with the performing arts, and leadership characteristics.

Table 16.1

SRBCSS Interscale Correlations, Group I[a]

	Learn	Motiv	Creat	Lead	Art	Mus	Drama	Comm-P	Comm-E	Plan
Learn		.63	.64	.32	-.19	-.03	.31	.84	.83	.61
Motiv			.60	-.16	.09	-.30	.32	.69	.60	.56
Creat				-.22	.17	-.11	.38	.64	.79	.43
Lead					-.32	.20	.25	.11	.09	.10
Art						-.27	.48	-.10	.04	.24
Mus							-.05	-.08	-.11	-.46
Drama								.24	.45	.44
Comm-P									.86	.60
Comm-E										.66

[a] $n = 15$ $r_{crit} = .51$

Table 16.2

SRBCSS Interscale Correlations, Group II[a]

	Learn	Motiv	Creat	Lead	Art	Mus	Drama	Comm-P	Comm-E	Plan
Learn		.58	.56	.69	.61	.21	.55	.27	.37	.28
Motiv			.61	.26	.45	.32	.09	.38	.27	.03
Creat				.52	.58	.17	.48	.24	.32	.19
Lead					.62	.02	.88	.15	.31	.45
Art						.37	.66	.49	.58	.35
Mus							.07	.57	.34	-.12
Drama								.08	.47	.63
Comm-P									.44	.14
Comm-E										.44

[a] $n = 14$ $r_{crit} = .53$

For the comparison subjects (Group II), significant correlations were present on each of the ten SRBCSS scales. Thus, there was no distinct pattern of scale correlations for Group II.

Table 16.3.

SRBCSS: Number of Significant Interscale Correlations

	Group I[a]	Group II[b]
Learn	5	5
Motiv	5	2
Creat	4	3
Lead	0	3
Art	0	1
Mus	0	1
Drama	0	4
Comm-P	5	1
Comm-E	5	1
Plan	4	1
Total:	28	26

[a] $\underline{n} = 15$

[b] $\underline{n} = 14$

Learning, Motivation, and Creativity Scales. The characteristics used most often to assess giftedness are those included in the Learning, Motivation, and Creativity scales of the SRBCSS. On these scales, one would expect to find more significant interscale intercorrelations for those nominated as gifted (Group I), than for those not so nominated (Group II). However, in this triad of scales, only the Motivation scale

clearly distinguished between Groups I and II, in terms of number of significant interscale correlations.

Communication and Planning Scales. Three other SRBCSS scales which seem important in relation to giftedness and achievement generally, are: Communication-Precision, Communication-Expression, and Planning. The first-mentioned scale deals with clarity of expression, while the second deals with richness of expression--verbal and non-verbal. In comparing the two groups, Group I, as expected, showed substantially more significant interscale correlations for each of these scales than did Group II. In particular, for Group I, these three scales were significantly correlated with the Learning, Motivation, and Creativity scales.

Leadership and Fine Arts. With respect to the characteristics evaluated on the Leadership, Art, Music, and Dramatics scales of the SRBCSS, for Group I, there were no significant relationships between any of these pairs of scales.

For Group II, each of these subscales correlated with other scales, but there was no discernable pattern to the correlations. The contrast between correlational patterns for Groups I and II is surprising, since it goes against the trend of the other subscale comparisons between Group I and II.

Qualitative Data

After the nomination forms were completed, the homeroom teacher-raters (n = 9) of Group I subjects were asked to respond to questions from the Teacher Interview Schedule (included in Appendix F). They were asked to specify what manifestations of giftedness they had observed in the subjects they nominated (Question 1), to specify what characteristics they thought were typical of hearing-impaired gifted students in general (Question 4)--if these responses were different from their responses regarding the nominees--and to comment on each of the nomination forms (Questions 5 and 6). Table 17 lists, in order of frequency, characteristics of giftedness which the raters throught were present in the students they nominated. All raters were comparing the nominees to their hearing-impaired peers.

Giftedness in the Hearing-Impaired. It can be seen from Table 17 that characteristics of giftedness in this hearing-impaired sample which seemed the most important, were those relating to the speed and range of cognitive abilities; the ease with which they appear to be used; the richness and precision of expressive language; and the extent of receptive language (comprehension). The extent to which these characteristics compare with those of the hearing gifted will be discussed later in this chapter.

When asked what characteristics were typical of gifted hearing-impaired generally, raters cited the characteristics listed above, as well as these:

Table 17.

Perceived Characteristics of Giftedness In Nominees (Group I, n = 15)

Frequency	Characteristic
7	Understands quickly
5	Superior recall
5	Grasps concepts easily
5	Outstanding academic ability in several areas (i.e., at or above grade level)
5	Applies learnings
3	Superior vocabulary
3	Expressive language: colourful, precise
3	Superior reasoning ability (logic, analysis)
3	Inquisitive
3	Superior task commitment
3	Eager to learn
2	Superior reading ability (rate, comprehension) (i.e., at or above grade level)
2	Confident in self and own abilities
2	Observant
2	Outstanding artistic ability/skills
2	Good sense of humour
2	Feels superior to others
2	Reflective (a "thinker")
1	Superior attention span
1	Transfers learnings to other areas, situations
1	Superior work attitude
1	Surpasses peers on achievement tests (e.g., Stanford Achievement Tests)
1	Competitive
1	Physically very active
1	Leadership Skills
1	Goal-oriented

- working at or above grade level
- have a variety of extracurricular interests (crafts, sports, reading)
- more socially mature than peers
- independent: can work alone
- sometimes sarcastic, in classroom
- sometimes engage in disruptive behaviour, in classroom

Nomination Forms: Comments and Criticisms

Of the 9 raters, 2 made no comments at all, leaving 7 respondents.

Scale for Rating Behavioural Characteristics of Superior Students (SRBCSS). Six of the 7 responding raters commented on the SRBCSS. Each respondent could have made more than one comment. With respect to the SRBCSS as a whole, 3 raters reported finding it too long. Comments and criticisms for each scale follow.

The Learning and Motivational scales received no criticisms; one rater found both to be "good." The Creativity scale received no comment or criticism. With respect to the Leadership scale, the only scale with no unscored items (Table 10, p. 62), only one rater found it the "least applicable" of the ten scales, finding the items (some? all?) "difficult to evaluate."

The visual and performing arts area included items on the Artistic, Musical, and Dramatic scales. One rater commented that Artistic characteristics were difficult to evaluate for older students since

there was no art program for them. Three raters commented that items dealing with musical characteristics were generally inapplicable to deaf children, but one rater added that these items might be applicable to the hard-of-hearing. The Musical characteristics scale had the highest percentage (46.7%) of unscored items (Table 10, p. 62). There were no comments or criticisms made regarding the Dramatics scale.

On both the Communication-Precision and Communication-Expression scales, 2 raters found inappropriate the items which evaluated the use of the voice (e.g., "Uses voice expressively to convey or enhance meaning"). On the Communication-Precision scale, one rater commented that it was difficult to evaluate a deaf child's use of descriptive language ("Uses descriptive words to add color, emotion, and beauty") because s/he typically does not use descriptive language. This might be more typical of the young deaf child who is still learning language than of the older deaf child who has a more extensive language base. On the same scale, one rater found item 10, "Is able to express ideas in a variety of alternate ways," difficult to evaluate in a deaf child. On the Planning scale, one rater found it generally difficult to evalute in deaf children, and particularly young, and/or young deaf children, because of their limited life experience. The same rater thought, however, that item 5, "Organizes his or her work well," was applicable to young (deaf) children.

Rating Gifted Students (RGS). The RGS drew comment from 2 of the 7 responding raters. One rater thought that the RGS was a "good,

condensed version" of the SRBCSS, while the other rater preferred the RGS to all of the other forms.

Teacher Observational Items (TOI). Four different raters commented on the TOI: one found it the simplest to use, one found no problem with it, one liked it the least of the four forms, and one thought that too many concepts were included in each item.

Nomination Form For Potentially Gifted Students (NFPGS). Two different raters commented on the NFPGS: one liked it the most of the four forms; the other thought that, generally, this form was inapplicable to the young (deaf) child because s/he would have had insufficient life experience and education to be evaluated by these items.

General Comments. Six of the seven responding raters made comments about the forms generally and made recommendations to guide those who, in the future, undertake the development of a nomination form appropriate for use with the hearing-impaired. Table 18.1 presents the comments and the frequencies with which each was made; Table 18.2 lists the raters' recommendations and the frequencies with which each was made.

Summary. Seven of the nine raters commented on the nomination forms. Only 3 of the responding raters expressed a preference for one form over another, and opinion was divided as to which was the most preferred. The RGS, TOI, and NFPGS received one vote apiece, while the

Table 18.1

Nomination Forms: Rater Comments and Criticisms

Frequency	Comments/Criticisma
2	The nomination procedure might segregate children by labelling them as gifted.
1	Risk-taking is not relevant in the evaluation of the gifted; instead, rate tendencies to perfectionism.
1	All forms were biased towards academic giftedness.
1	Language-related items are inappropriate for the young child who is still learning language.
1	"Many" questions had too much information in them.

SRBCSS received none. Because of its length and detail, the SRBCSS drew the most comment. Comments (Table 18.1) and recommendations (Table 18.2) varied from rater to rater, with no clear pattern of unanimity emerging. The only exception to this was the recommendation of 4 of the 7 respondents that items pertaining to communication must assess in terms that are relevant to the hearing-impaired.

Discussion

Summary of Results

As expected, the mean IQ percentile for the nominated group (79.4) was significantly higher than that for the comparison group (48.9). With respect to each of the nomination forms, the mean scores for Group

Table 18.2

Nomination Forms: Rater Recommendations

Frequency	Comments/Criticisma
4	Design items to assess communication characteristics relevant for the hearing-impaired (e.g., facility with American Sign Language; quality of signing and gestures).
1	Use a one- to two-page form.
1	Leave space for additional comments.
1	Use open-ended responses.
1	Include items to assess giftedness in non-academic areas (e.g., visual and performing arts). Include a related task for the nominee to complete.
1	Include item(s) which assess(es) vocabulary.
1	Include item(s) which assess(es) memory.
1	Make each item single-concept.

I were significantly higher than those for Group II, with the exception of the Musical scale of the SRBCSS on which there was no significant difference.

When IQ was correlated with each of the four nomination forms, no significant relationship was found for either Group I or Group II. Although it was expected that for the comparison group (Group II), IQ score and nomination score would function independently, a significant correlation was expected for the nominated group (Group I). This result raises questions concerning the nature of the relationship between the nomination forms and the IQ measures.

When scores on the four nomination forms were correlated, a significant relationship among all four was found for Group I, but for only three of the forms for Group II: Rating Gifted Students (RGS), Teacher Observational Items (TOI), and Nomination Form for Potentially Gifted Students (NFPGS). For Group II, the SRBCSS did not correlate with the other three nomination forms.

Within the SRBCSS, there was no consistent pattern of correlations between any of the scales for either group, although there was a contrast between a selected group of scales: Leadership, Artistic, Musical, and Dramatics. For Group I, there were no significant correlations at all among these four scales, while for Group II, there were scattered significant correlations among them.

Giftedness in the Hearing-Impaired

As observed in the Literature Review (Chapter II), literature relating to giftedness in the hearing-impaired is scarce. Each of the three programs reported in Chapter II (Gallaudet College Young Scholar's Program; Texas School for the Deaf, 1980; Whiting, Anderson, & Ward, 1980) dealt with different identification procedures and criteria. In the absence of standardized criteria, and for the purpose of this study, comparison will be made between the findings of the present investigation and the criteria for giftedness set forth by the Alberta Education Task Force (Alberta Education, 1984), and discussed in Chapter II.

The Task Force defined giftedness as exceptional performance in one or more of four areas: general intellectual ability, specific academic aptitude, creative or productive thinking, visual and performing arts. From those nominated and evaluated in any area or any combination of these areas, the Task Force recommended selecting the top 3-5% of students for gifted programming. Although giftedness, by definition, can occur in one or more of four areas, the present study was limited to the identification of students who were intellectually gifted. Although teachers in the present study rated the nominees in the other three areas, these ratings were not verified by an examination of student products, or by the administration of tests related to these areas.

Prevalence of Intellectual Giftedness at ASD

In discussions on giftedness, there is some inconsistency in the literature in the use of percentage ranges (e.g., upper 2%, 3-5%, etc.). Some authors (e.g., Maker, 1977) use it to estimate the prevalence of giftedness occurring in a given population; others (Alberta Education, 1984; Davis & Rimm, 1985; Whiting, Anderson, & Ward, 1980) use it as a guideline to determine how many students from the nomination pool will be chosen to participate in gifted programming. The latter use of a percentage or percentage range does not describe the prevalence of giftedness in a given population, but is, rather, an arbitrary cutoff criterion.

At the Alberta School for the Deaf, out of a total population of 124 students, of whom, typically, 97% have hearing losses greater than 70 dB (C. Hurtig, personal communication), initially 16 (13% of the total population) were nominated by teachers as gifted. One of these subjects was dropped from the study because his/her degree of hearing loss was found to be less than 70 dB, the cutoff level of hearing loss established for the study. This left 15 subjects (12% of the total ASD population).

In addition to the 15 students nominated by teachers, five students, not nominated by teachers, were informally nominated by the school psychologist--who was not officially included in the study--on the basis of "high" IQ (90th percentile and above), and one student, also not nominated by teachers, assigned by chance to the age-matched comparison group, was found to have an IQ at the 96th percentile. The possible reasons for the omission of these six students from the nominated group are presented later in this chapter.

Using the Alberta Education guideline, students whose IQs fall within the top 5% (at or above the 95th percentile), or in the top 3% (at or above the 97th percentile) are considered to be intellectually gifted. Included in both of the research groups and in the psychologist's nominations, there were eight students (four in Group I, one in Group II, three nominated informally by the psychologist), or 6.5% of the total school population ($N = 124$) whose IQ fell within the top five percentiles, and three students (one from Group I, two

nominated by the psychologist), or 2.4% of the total school population whose IQs fell within the top three percentiles.

In the Texas study (Texas School for the Deaf, 1980), 17% (n = 91), of the total student population (N = 537) were nominated as gifted through a multiple criteria process of testing and teacher recommendation. The top approximately 5% (0.9% of the total TSD school population) of the nominated group was accepted for gifted programming. In the Whiting, Anderson, and Ward study (1980), the nominated group (unspecified size) resulted from teacher recommendation using a nomination form. The use of an identification criterion of the top 2% on an individually administered IQ test resulted in the acceptance of approximately 8% of the total deaf population in the Covina-Valley Unified School District (N = 200) for gifted programming.

High IQ Students Not Nominated by Teachers

At the Alberta School for the Deaf, six subjects (five nominated informally by the school psychologist, one in the age-matched group) had IQs at or above the 90th percentile, but no other apparent indicators of giftedness. For the students who were found to have high IQs, but were not nominated by teachers, the psychologist commented that this might have been due to behaviours such as withdrawal, lack of cooperation, disruptiveness, inattentiveness, and apathy, observed in these students. These characteristics, coupled with high IQ, were also found by Nasca (1979) to occur among disabled gifted students, and to be typical of gifted underachievers. The findings of the present study are also

consistent with those of Davis and Rimm (1985), Eisenberg and Epstein (1981), Maker (1977), and Pledgie (1982) that, in general, teachers tend to nominate as gifted, students who are cooperative, conforming, and who are not behaviour problems.

IQ Differences: DC/DP Versus DC/HP

As discussed in Chapter II, there is a tendency for deaf children of deaf parents (DC/DP) to obtain higher IQ scores than those for deaf children of hearing parents (DC/HP) (Kusché et al., 1983). While the same trend was observed in the present study, valid conclusions on this issue cannot be drawn, since both groups in the study were biased samples, and not necessarily representative of the entire ASD population.

IQ and the Nomination Forms

For those nominated as gifted (Group I), overall, no significant relationship was found between IQ and any of the nomination forms. To illustrate this disparity, the rank orders for IQ percentiles and the rank orders for the scores on each of the nomination forms, for all Group I subjects, is given in Table 19. The four subjects whose IQs fell in the top five percentiles are marked with an asterisk.

The results of the present study would suggest that the IQ tests and nomination forms were measuring different underlying factors. All IQ tests used in the study were measures of nonverbal performance,

Table 19.

Rank Ordering of IQ Percentiles and Nomination Scores, Group I[a]

	I.D.	IQ	SRBCSS	RGS	TOI	NFPGS
*	4	1	4	2	4.5	12.5
*	8	2.5	1	1	2.5	5
*	15	2.5	15	13.5	13	14
*	7	4	6	6	7.5	6
	13	5	7	7	1	3
	16	6	14	15	14	15
	2	7	2	3.5	6	3
	9	8.5	11	12	12	7.5
	11	8.5	12	10	10	7.5
	6	10	3	3.5	2.5	1
	5	11	8	11	10	10
	10	12	10	8.5	7.5	10
	14	13	5	5	4.5	3
	1	14	13	8.5	10	10
	12	15	9	13.5	15	12.5

[a] $n = 15$

involving visual-spatial analysis, mainly, whereas each of the nomination forms included items relating to a variety of areas, such as: learning characteristics, thinking skills, receptive and expressive language ability. A second possible explanation for the nonsignificant relationship between IQ and the nomination forms is the variation in rater conceptualization of giftedness. In a study examining variables which affect rater effectiveness in identifying giftedness in a hearing sample, Ashman and Vukelich (1983) found that inservice training on identification procedures given to teachers prior to completion of nomination forms resulted in a high rate of accuracy (as verified by IQ score) in identifying intellectually gifted students.

Effectiveness of the Teacher Nomination Process

Because only four out of the eight students with IQs in the top five percentiles were identified through teacher nomination, the teacher nomination process, in this study, was, at best, 50% effective in identifying the gifted hearing-impaired at ASD. As mentioned earlier in this chapter, unless alerted to the positive meaning of behaviours such as apathy and disruptiveness, which can mask giftedness, there is a tendency for teachers to nominate as gifted, those students who appear bright, are cooperative and conforming.

Effectiveness of the Four Nomination Forms

Each of the four forms was found to be capable of distinguishing between the nominated gifted (Group I) and the age-matched comparison subjects (Group II). With the exception of the Musical Characteristics Scale of the SRBCSS, the mean score for Group I was higher on all other scales of the SRBCSS, and on each of the four forms overall. It is likely that there was no significant difference in mean score with respect to musical characteristics--both were uniformly low--because subjects in both groups were hearing-impaired, most of them profoundly (HL > 90 dB). Teachers rated nominees higher than the age-matched subjects on each form (see Table 13 for mean scores); that is, teachers thought that gifted characteristics were more in evidence in Group I subjects than in Group II subjects. Supplementary data gathered in the follow-up interviews supported this observation.

Interrelationship of the Four Nomination Forms

For those nominated as gifted (Group I), all four forms were found to be modestly interrelated, with correlations ranging from .86 to .68. This would suggest that, to a certain extent, the forms were measuring similar characteristics.

The highest correlations were between the SRBCSS and both the RGS and TOI forms. The SRBCSS-RGS correlation is not surprising, in view of the fact that, from inspection, it is obvious that many of the items on the latter were developed directly from items on the former. The derivation of the RGS items from the SRBCSS is discussed at the beginning of this chapter in connection with unscored items.

The reason for the high SRBCSS-TOI correlation is somewhat more complex. The seven characteristics evaluated on the TOI were those which Pledgie (1982), during an extensive search, found to be common to checklists designed to screen for giftedness in normal and exceptional school populations (see discussion in Chapter III). The relationship between the two forms suggests that characteristics of giftedness in both normal and exceptional populations may be quite similar.

For comparison subjects (Group II), the SRBCSS did not correlate significantly with any of the other forms. However, significant correlations were observed between the other three forms. These findings suggest that for this group, the SRBCSS was measuring factors

different from those measured by the other three, and that the three correlated forms were measuring similar factors.

SRBCSS Subscale Correlations with Total SRBCSS, Group I

The purpose of calculating correlations between subscales of the SRBCSS and the total SRBCSS (Table 15, p. 77) was to investigate the proportion of shared variance using the coefficient of determination (r^2). If one assumes that the total SRBCSS score represents the extent to which a given child is gifted globally, in the Renzullian sense--i.e., the interaction of general abilities, task commitment, and creativity--one can see from the coefficient of determination what percentage (r^2 x 100) of the variability in each scale contributed to the variability in the total SRBCSS score. An implication of this analysis is that items from the scales with the highest correlations--Communication-Expression (.87), Planning (.83), Learning (.80), and Communication-Precision (.80)--would be useful to include on nomination forms that are developed in future for use with the hearing-impaired.

SRBCSS Interscale Correlations, Group I

The purpose of calculating correlations between pairs of SRBCSS scales was to examine the proportion of shared variance using the coefficient of determination (r^2). From Table 16.1, page 79, it can be seen that the following pairs shared the highest proportion of variance: Communication-Precision--Communication-Expression (74%), Communication-Precision--Learning (71%), Communication-Expression--Learning (69%),

Communication-Expression--Creativity (62%). These interrelationships suggest that a common factor was contributing to both scales in each pair. In the previous discussion on SRBCSS subscales, it was seen that each of these scales, plus the Planning scale, also shared the highest amount of variance with the total SRBCSS score. These interscale relationships, together with the subscale-total SRBCSS relationships reinforce the importance of these scales in assessing giftedness in the hearing-impaired.

Characteristics of Giftedness: Hearing-Impaired and Hearing Subjects

A comparison of the characteristics of giftedness in deaf students put forth by the raters in this study (see Table 17), and those commonly reported for hearing students (see Chapter II), reveals that, in many ways, in both populations, giftedness is manifested in the same ways: quick understanding, superior recall, superior vocabulary, etc. In one respect, however, the two differ: whereas gifted hearing students frequently function above grade level, gifted hearing-impaired students are regarded as exceptional if functioning at grade level. A discussion of reasons for lags in academic achievement in the hearing-impaired was given in Chapter II.

CHAPTER FIVE

IMPLICATIONS

When a school or school board has determined what funding and personnel are available for gifted programming, and has decided upon the nature of the programming to be offered, it can then design a relevant selection procedure.

Since giftedness, as defined by the Alberta Education Task Force (Alberta Education, 1984) can be in one or more of four areas--general intellectual ability, specific academic aptitude, creative or productive thinking, visual and performing arts--it follows that the selection process should include multiple criteria. This increases the probability that students whose giftedness is neither intellectual (high IQ) nor academic (high achievement test score/s), or who are gifted underachievers, will be identified by some stage of the process. Although this study focussed on intellectual giftedness, screening, ideally, should include evaluation in all four areas.

Because of the lack of information on the characteristics of gifted hearing-impaired children, and on the selection and identification process appropriate for use with them, there is a need for further research to confirm that giftedness and hearing impairment do co-exist, to identify the characteristics of giftedness in the hearing-impaired, to disseminate this information, and to design appropriate and effective

nomination and identification measures. Since IQ is often assigned the greatest weight, or is a major factor in determining selection for gifted programming, for both hearing and hearing-impaired populations, the present study chose to investigate the relationship between IQ and four nomination forms. The investigation was not without some limitations.

Limitations

The sample was drawn from a single school for the deaf population. Generally, students at schools for the deaf tend to have Severe (70 - 90 dB) to Profound (> 90 dB) hearing losses and/or a language-based disability, secondary to the hearing loss, whose severity precludes instruction in a regular classroom. This was true of the subjects in this study. Thus, the findings of the present study may be less applicable to children whose hearing impairment is less than 70 dB, and/or who are in regular classrooms. Hearing-impaired children in regular classrooms tend to have less severe language and communication difficulties than children attending schools for the deaf.

A second limitation regarding the sample relates to the manner in which the groups were formed. Since the nominated group (Group I) was formed by teacher nomination, and not by systematic selection on the basis of IQ, it could be argued that some eligible students might have been missed. However, since the school psychologist, who contributed informally to the nominations, was very familiar with the IQs of the entire student body, it is very unlikely that any other intellectually

gifted students in the school were not identified, whether by nomination by teachers or the psychologist.

IQ

In the present study, four different IQ measures, administered by several examiners (but most administered by the school psychologist) had been used. In order to make statistical comparisons, all IQ scores, collected from school files, were converted to percentiles. Because percentiles are unequal units of measurement, calculations involving them must be interpreted cautiously. Ideally, the same IQ measure, administered by one examiner, should have been used, to ensure a certain degree of standardization, and to enable accurate statistical calculations and meaningful comparisons to be made.

Nomination Forms: Unscored Items

An oversight in the pre-study briefing given to teachers was the instruction to score every item. As a result, some left items unscored, especially when they thought that the items were inapplicable to the nominee. After comparing two data analyses for which unscored items were assigned values of 0 and 1 respectively, and finding little difference, the author decided to assign to each unscored item a value of 1, which indicated that a given characteristic was seldom or never present. One benefit which resulted from this oversight was that of

drawing to the author's attention, the nature of the items which were perceived as irrelevant/inapplicable to hearing-impaired subjects.

Recommendations

Nomination Forms

From the qualitative data collected in this study, several recommendations regarding the design of a nomination form for use with a hearing-impaired population can be made.

Many raters were critical of the length of the SRBCSS (ten pages), and the length of time required to complete it (approximately 30 minutes). They preferred, instead, the one-page forms. Several raters commented that a nomination form should not exceed two pages. Since nomination is but one stage of the identification process, it seems that a short, well-designed form could accomplish that of a lengthier one.

None of the raters criticized the four-point rating system, but some suggested that each item include space for additional and amplifying comments. The use of a numerical rating system, as opposed to an exclusively open-ended one, allows a summary of a nominee's standing to be made fairly easily and quickly, and simplifies the comparison among nominees.

In terms of item content, some raters suggested that items pertaining to communication skills be relevant to the hearing-impaired. These items could be developed from existing checklists of communication skills used with the hearing-impaired, and/or from suggestions made by

their teachers and speech therapists. An alternative way of handling items pertaining to communication would be to use very general statements, such as those which appear on the nomination form used by the Covina-Valley Unified School District (Whiting, Anderson, & Ward, 1980, p. 32): "Expresses himself/herself well in writing and speaking," "Uses a rich vocabulary accurately."

While most raters agreed that assessment of musical ability was irrelevant, there was general agreement that provision should be made to evaluate nominees in other visual and performing arts, and in creative thinking. Whether or not these areas are evaluated will depend on whether or not enrichment in these areas is to be offered. If related programming is to be offered, then evaluation of student products can be made. The Texas School for the Deaf Study (1980) outlines in some detail, an appraisal procedure to use in the visual and performing arts. To assess creative thinking ability, a measure such as the Figural Form of the Torrance Tests of Creative Thinking (Torrance, 1966-74) can be used. The Texas School for the Deaf found it useful with 6 to 14 year olds.

Finally, it is important to include on a nomination form items which will help to identify gifted underachievers. Examples of such items can be found on the NFPGS (Nasca, 1979), items 5, 6, 7, and 9; for example, "Questions arbitrary decisions," "Withdrawn, yet capable when pressed," or in Gowan's Checklist of Creative Positives (Gowan, 1975); for example, "Able child who is the biggest nuisance."

Programming for Gifted Hearing-Impaired

From the nomination procedure, a group of potentially gifted students will have been identified. Budgetary and personnel constraints will dictate the nature of the programming to be offered, and the number of students who can be accommodated. The final number of students selected typically involves the top 4-5% of the nominated group.

Of the program models outlined in Chapter II--Identification-Placement, and Assess-Educate--the most flexible is the latter, of which Renzulli's Revolving Door Model (Renzulli, 1981) is the main example. Progress and student interests are monitored on an ongoing basis, which allows for continuous student movement into and out of the program. However, this model makes additional demands on the regular classroom teacher's time: to continually assess students, and to develop and provide enrichment activities for the participants. The Texas School for the Deaf uses this approach successfully with its students. Locally, the Edmonton Catholic Schools uses this approach with hearing students.

Suggestions for Further Research

This study, while addressing the issue of the relationship between IQ and four nomination forms, and examining the effectiveness of four nomination forms in identifying hearing-impaired gifted students, has also pointed to the paucity of literature pertaining to all aspects of

giftedness in the hearing-impaired, and to the need for further investigation in every aspect of this issue.

Much of the groundwork for the identification process has already been laid by the Texas School for the Deaf. Theirs is a model which is worth replicating, in whole or in part, with comparable Canadian populations.

Growing directly out of the present study, is the opportunity to develop a nomination form appropriate for use with the hearing-impaired, utilizing the findings and recommendations of this study, as well as those arising from other studies (Texas School for the Deaf, 1980; Whiting, Anderson, & Ward, 1980).

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APPENDIX A

Scales for Rating the Behavioral Characteristics of Superior Students

Adapted from:

Joseph S. Renzulli / Linda H. Smith / Alan J. White / Carolyn M. Callahan / Robert K. Hartman

Name _____ Date _____

School _____ Grade _____ Age _____

Teacher or person completing this form _____

How long have you known the child? _____ Months.

Part I: Learning Characteristics	Seldom or Never	Occasionally	Often	Almost Always
1. Has unusually advanced vocabulary for age or grade level; uses terms in a meaningful way; has verbal behavior characterized by "richness" of expression, elaboration, and fluency.	1	2	3	4
2. Possesses a large storehouse of information about a variety of topics (beyond the usual interests of youngsters his age).	1	2	3	4
3. Has quick mastery and recall of factual information.	1	2	3	4
4. Has rapid insight into cause-effect relationships; tries to discover the how and why of things; asks many provocative questions (as distinct from informational or factual questions); wants to know what makes things (or people) "tick."	1	2	3	4
5. Has a ready grasp of underlying principles and can quickly make valid generalizations about events, people, or things; looks for similarities and differences in events, people, and things.	1	2	3	4
6. Is a keen and alert observer; usually "sees more" or "gets more" out of a story, film, etc. than others.	1	2	3	4
7. Reads a great deal on his own; usually prefers adult level books; does not avoid difficult material; may show a preference for biography, autobiography, encyclopedias, and atlases.	1	2	3	4
8. Tries to understand complicated material by separating it into its respective parts; reasons things out for himself; sees logical and common sense answers.	1	2	3	4

Part II: Motivational Characteristics	Seldom or Never	Occasionally	Often	Almost Always
1. Becomes absorbed and truly involved in certain topics or problems; is persistent in seeking task completion. (It is sometimes difficult to get him to move on to another topic.)	1	2	3	4
2. Is easily bored with routine tasks.	1	2	3	4
3. Needs little external motivation to follow through in work that initially excites him.	1	2	3	4
4. Strives toward perfection; is *self* critical; is not easily satisfied with his own speed or products.	1	2	3	4
5. Prefers to work independently; requires little direction from teachers.	1	2	3	4
6. Is interested in many "adult" problems such as religion, politics, sex, race — more than usual for age level.	1	2	3	4
7. Often is *self* assertive (sometimes even aggressive); stubborn in his beliefs.	1	2	3	4
8. Likes to organize and bring structure to things, people, and situations.	1	2	3	4
9. Is quite concerned with right and wrong, good and bad; often evaluates and passes judgment on events, people, and things.	1	2	3	4

Part III: Creativity Characteristics	Seldom or Never	Occasionally	Often	Almost Always
1. Displays a great deal of curiosity about many things; is constantly asking questions about anything and everything.	1	2	3	4
2. Generates a large number of ideas or solutions to problems and questions; often offers unusual ("way out"), unique, clever responses.	1	2	3	4
3. Is uninhibited in expressions of opinion; is sometimes radical and spirited in disagreement; is tenacious.	1	2	3	4
4. Is a high risk taker; is adventurous and speculative.	1	2	3	4
5. Displays a good deal of intellectual playfulness; fantasizes; imagines ("I wonder what would happen if . . ."); manipulates ideas (i.e., changes, elaborates upon them); is often concerned with adapting, improving and modifying institutions, objects, and systems.	1	2	3	4
6. Displays a keen sense of humor and sees humor in situations that may not appear to be humorous to others.	1	2	3	4
7. Is unusually aware of his impulses and more open to the irrational in himself (freer expression of feminine interest for boys, greater than usual amount of independence for girls); shows emotional sensitivity.	1	2	3	4
8. Is sensitive to beauty; attends to aesthetic characteristics of things.	1	2	3	4
9. Nonconforming; accepts disorder; is not interested in details; is individualistic; does not fear being different.	1	2	3	4
10. Criticizes constructively; is unwilling to accept authoritarian pronouncements without critical examination.	1	2	3	4

Part IV: Leadership Characteristics	Seldom or Never	Occasionally	Often	Almost Always
1. Carries responsibility well; can be counted on to do what he has promised and usually does it well.	1	2	3	4
2. Is self confident with children his own age as well as adults; seems comfortable when asked to show his work to the class.	1	2	3	4
3. Seems to be well liked by his classmates.	1	2	3	4
4. Is cooperative with teacher and classmates; tends to avoid bickering and is generally easy to get along with.	1	2	3	4
5. Can express himself well; has good verbal facility and is usually well understood.	1	2	3	4
6. Adapts readily to new situations; is flexible in thought and action and does not seem disturbed when the normal routine is changed.	1	2	3	4
7. Seems to enjoy being around other people; is sociable and prefers not to be alone.	1	2	3	4
8. Tends to dominate others when they are around; generally directs the activity in which he is involved.	1	2	3	4
9. Participates in most social activities connected with the school; can be counted on to be there if anyone is.	1	2	3	4
10. Excels in athletic activities; is well coordinated and enjoys all sorts of athletic games.	1	2	3	4

Part V: Artistic Characteristics	Seldom or Never	Occasionally	Often	Almost Always
1. Likes to participate in art activities; is eager to visually express ideas.	1	2	3	4
2. Incorporates a large number of elements into art work; varies the subject and content of art work.	1	2	3	4
3. Arrives at unique, unconventional solutions to artistic problems as opposed to traditional, conventional ones.	1	2	3	4
4. Concentrates for long periods of time on art projects.	1	2	3	4
5. Willingly tries out different media; experiments with a variety of materials and techniques.	1	2	3	4
6. Tends to select art media for free activity or classroom projects.	1	2	3	4
7. Is particularly sensitive to the environment; is a keen observer — sees the unusual, what may be overlooked by others.	1	2	3	4
8. Produces balance and order in art work.	1	2	3	4
9. Is critical of own work; sets high standards of quality; often reworks creation in order to refine it.	1	2	3	4
10. Shows an interest in other student's work — spends time studying and discussing their work.	1	2	3	4
11. Elaborates on ideas from other people — uses them as a "jumping off point" as opposed to copying them.	1	2	3	4

Part VI. Musical Characteristics				
1. Shows a sustained interest in music — seeks out opportunities to hear and create music.	1	2	3	4
2. Perceives fine differences in musical tone (pitch, loudness, timbre, duration.)	1	2	3	4
3. Easily remembers melodies and can produce them accurately.	1	2	3	4
4. Eagerly participates in musical activities.	1	2	3	4
5. Plays a musical instrument (or indicates a strong desire to).	1	2	3	4
6. Is sensitive to the rhythm of the music; responds through body movements to changes in the tempo of the music.	1	2	3	4
7. Is aware of and can identify a variety of sounds heard at a given moment — is sensitive to "background" noises, to chords that accompany a melody, to the different sounds of singers or instrumentalists in a performance.	1	2	3	4

Part VII: Dramatics Characteristics	Seldom or Never	Occasionally	Often	Almost Always
1. Volunteers to participate in classroom plays or skits.	1	2	3	4
2. Easily tells a story or gives an account of some experience.	1	2	3	4
3. Effectively uses gestures and facial expressions to communicate feelings.	1	2	3	4
4. Is adept at role-playing, improvising, acting out situations "on the spot."	1	2	3	4
5. Can readily identify himself with the moods and motivations of characters.	1	2	3	4
6. Handles body with ease and poise for his particular age.	1	2	3	4
7. Creates original plays or makes up plays from stories.	1	2	3	4
8. Commands and holds the attention of a group when speaking.	1	2	3	4
9. Is able to evoke emotional responses from listeners — can get people to laugh, to frown, to feel tense, etc.	1	2	3	4
10. Can imitate others — is able to mimic the way people speak, walk, gesture.	1	2	3	4

Part VIII: Communication Characteristics — Precision				
1. Speaks and writes directly and to the point.	1	2	3	4
2. Modifies and adjusts expression of ideas for maximum reception.	1	2	3	4
3. Is able to revise and edit in a way which is concise, yet retains essential ideas.	1	2	3	4
4. Explains things precisely and clearly.	1	2	3	4
5. Uses descriptive words to add color, emotion, and beauty.	1	2	3	4
6. Expresses thoughts and needs clearly and concisely.	1	2	3	4
7. Can find various ways of expressing ideas so others will understand.	1	2	3	4
8. Can describe things in a few very appropriate words.	1	2	3	4
9. Is able to express fine shades of meaning by use of a large stock of synonyms.	1	2	3	4
10. Is able to express ideas in a variety of alternate ways.	1	2	3	4
11. Knows and can use many words closely related in meaning.	1	2	3	4

Part IX. Communication Characteristics — Expressiveness	Seldom or Never	Occasionally	Often	Almost Always
1. Uses voice expressively to convey or enhance meaning.	1	2	3	4
2. Conveys information non-verbally through gestures, facial expressions, and "body language."	1	2	3	4
3. Is an interesting storyteller.	1	2	3	4
4. Uses colorful and imaginative figures of speech such as puns and analogies.	1	2	3	4

Part X: Planning Characteristics				
1. Determines what information or resources are necessary for accomplishing a task.	1	2	3	4
2. Grasps the relationship of individual steps to the whole process.	1	2	3	4
3. Allows time to execute all steps involved in a process.	1	2	3	4
4. Foresees consequences or effects of actions.	1	2	3	4
5. Organizes his or her work well.	1	2	3	4
6. Takes into account the details necessary to accomplish a goal.	1	2	3	4
7. Is good at games of strategy where it is necessary to anticipate several moves ahead.	1	2	3	4
8. Recognizes the various alternative methods for accomplishing a goal.	1	2	3	4
9. Can pinpoint where areas of difficulty might arise in a procedure or activity.	1	2	3	4
10. Arranges steps of a project in a sensible order or time sequence.	1	2	3	4
11. Is good at breaking down an activity into step by step procedures.	1	2	3	4
12. Establishes priorities when organizing activities.	1	2	3	4
13. Shows awareness of limitations relating to time, space, materials, and abilities when working on group or individual projects.	1	2	3	4
14. Can provide details that contribute to the development of a plan or procedure.	1	2	3	4
15. Sees alternative ways to distribute work or assign people to accomplish a task.	1	2	3	4

APPENDIX B

RATING GIFTED STUDENTS

STUDENT _____ GRADE _____ AGE _____

SCHOOL _____ RATER _____

INSTRUCTIONS. Circle the category which best describes the student's behavior.

	Seldom or Never	Occasionally	Often	Almost Always
1. Is curious, inquires about many varied topics. Explores new things and ideas.	1	2	3	4
2. Generates many ideas or responses to a question or task. Is not satisfied with a single idea or answer.	1	2	3	4
3. Generates and considers alternative solutions and points of view.	1	2	3	4
4. Devises new methods of problem solution, or produces unique and imaginative responses.	1	2	3	4
5. Is a keen and alert observer. Usually sees more or gets more out of a story, picture, experience, etc. than others.	1	2	3	4
6. Elaborates through detail and complexity, written and oral responses, drawings, models, etc.	1	2	3	4
7. Is highly self-motivated. Becomes absorbed in a topic, carries interest to independent after-school activities.	1	2	3	4
8. Works independently, displays initiative and requires little direction to carry through on tasks.	1	2	3	4
9. Sets realistic goals. Organizes time and takes into account the the elements/details necessary to accomplish a goal.	1	2	3	4
10. Foresees consequences or effects of actions or decisions.	1	2	3	4
11. Is persistent in task completion, including those tasks in which he or she has little interest.	1	2	3	4
12. Has a ready grasp of underlying principles and can quickly make valid generalizations about events, people or things. Looks for similarities and differences in events, people and things.	1	2	3	4
13. Has high standards. Is not easily satisified with his or her own performance or products.	1	2	3	4
14. Tries to understand complicated materials/ideas by separating them into respective parts. Reasons things out for himself or herself. Sees logical and common sense answers.	1	2	3	4
15. Is a high risk taker. Explores or defends unusual ideas regardless of the reactions of others.	1	2	3	4

APPENDIX C

TEACHER OBSERVATIONAL ITEMS

STUDENT _____ GRADE _____ AGE _____

SCHOOL _____ RATER _____

INSTRUCTIONS. For each student who you think might be gifted, rate the following behaviors. The space following each item may be used for your written comments.

	Seldom or Never	Occasionally	Often	Almost Always
1. Has advanced, expressive, and elaborate vocabulary. May read prior to entering school.	1	2	3	4
2. Easily memorizes and recalls information.	1	2	3	4
3. Is aware of cause/effect relationships. Questions and applies information - not just recalls facts.	1	2	3	4
4. Engages in divergent thinking. Generalizes and provides more than one possible correct answer.	1	2	3	4
5. Has prolonged attention span. Is persistent.	1	2	3	4
6. Has many interests. Is curious. May be a high risk taker.	1	2	3	4
7. Displays a sense of humor.	1	2	3	4

APPENDIX D

NOMINATION FORM FOR POTENTIALLY GIFTED STUDENTS

STUDENT _____ GRADE _____ AGE _____

SCHOOL _____ RATER _____

INSTRUCTIONS: Complete this form for each child who you think might be gifted.

	Seldom or Never	Occasionally	Often	Almost Always
1. Asks how or why questions. Not in reference to standard tasks such as arithmetic algorithms or clarification of assignments but rather, questions that get at causes of, reasons for, general abstractions, and/or application of principles.	1	2	3	4
2. Offers alternative methods for standard procedures. Demonstrates insight by offering alternative ways of completing standard tasks. Although you may recognize these as tried and rejected procedures, the students have not necessarily had this experience and their alternatives may represent fresh insight for their level of experience.	1	2	3	4
3. Has extensive knowledge in some out-of-school oriented topic. May possess a sophisticated collection of models, stamps, coins, Civil War mementos, etc. or possess unusual knowledge about sporting events, fossils, gaming techniques, etc. Frequently shared only if pressed.	1	2	3	4
4. Suggests grandiose solutions and/or projects. Often lacks experience in evaluating consequences of certain actions but has the insight to recognize that some unique solution will solve the problem. Plans often exceed an ability to actually carry them out.	1	2	3	4
5. Questions arbitrary decisions. More outgoing students may question wisdom of arbitrary decisions that lack obviously relevant justification. May desire to explore reasons for the decisions and may seek alternatives.	1	2	3	4
6. Is bored with traditional courses of study. May be bored with knowledge oriented programs that lack any real challenge to their thinking capabilities. These students acquire information quickly and seldom need the repetition so often emphasized in many common courses of study.	1	2	3	4
7. Withdrawn yet capable when pressed. Academically gifted students occasionally hide their gifts because of the fear of being labeled "different".	1	2	3	4
8. Alert to stimuli in the environment. Not necessarily to the point of being easily distracted but rather, observant. Able to handle several variables simultaneously and frequently able to read and listen at the same time.	1	2	3	4
9. Fails to complete homework but appears extremely capable. This student may resist completing low level tasks frequently included in busy work and practice examples included in textbooks and workbooks. These tasks are boring and fail to represent a challenge.	1	2	3	4

APPENDIX E

HEARING-IMPAIRED GIFTED PROJECT

DATA SHEET

Code Nr._____ Date_____

Date of Birth_____ Sex____ Age_____ Grade_____

School_____ Day Student_____ Residential____

Cause of Deafness & Diagnosis

Familial History of Deafness/Hearing Impairment

Parents: Hearing Deaf

Audiological Assessment

Standardized Tests & Scores

Other Tests & Scores (Report Card, etc.)

Additional Comments

APPENDIX F

HEARING-IMPAIRED GIFTED PROJECT
TEACHER INTERVIEW

Teacher _____

Student _____

Purpose: We would really like to know what your thoughts were when you nominated this student.

1. Why do you think that _____ is gifted?

2. How confident are you that this student is gifted? (Circle appropriate number).

   1 Very unsure
   2 Somewhat unsure
   3 Somewhat confident
   4 Very confident

3. To whom, or to what group (hearing/hearing-impaired) were you comparing the student you nominated?

   _____

4. What characteristics do you think are typical of gifted hearing-impaired students?

5. Which of the 4 questionnaires were most and least useful?

   A.

Most	Least	
____	____	Scales for Rating...Superior Students
____	____	Rating Gifted Students
____	____	Nomination Form for Potentially Gifted Students
____	____	Teacher Observational Items

   B. Which items were most and least useful? Why? (Item numbers, "most" and "least" rating, and reasons).

   Scales for Rating...Superior Students

Rating Gifted Students

Nomination Form for Potentially Gifted Students

Teacher Observational Items

6. What suggestions do you have for improving the nomination forms for use with hearing-impaired students? Were any characteristics omitted or irrelevant?

7. Do you think there are any children who might have been missed by these forms? (Names, characteristics - behavioral, academic, etc.)

APPENDIX G

UNSCORED ITEMS: ITEM-BY-ITEM TALLY

Form	Frequency Group I (n = 15)	Group II (n = 14)
SRBCSS		
Learn (8 items)		
1	1	0
2	0	0
3	1	0
4	0	0
5	0	0
6	0	0
7	4	1
8	1	0
Motiv (9 items)		
1	1	0
2	0	0
3	0	0
4	0	0
5	0	0
6	3	3
7	0	0
8	0	0
9	0	0
Creat (10 items)		
1	0	0
2	0	0
3	1	0
4	0	0
5	3	3
6	0	0
7	3	2
8	3	2
9	0	0
10	0	1
Lead (10 items)		
1	0	0
2	0	0

Form	Frequency Group I	Group II
SRBCSS		
Lead (cont'd.)		
3	0	0
4	0	0
5	0	0
6	0	0
7	0	0
8	0	0
9	0	0
10	0	0
Art (11 items)		
1	0	1
2	3	1
3	4	1
4	1	1
5	1	1
6	1	1
7	3	3
8	3	1
9	1	2
10	1	1
11	2	2
Music (7 items)		
1	7	4
2	7	5
3	7	5
4	5	4
5	8	7
6	7	4
7	8	5
Drama (10 items)		
1	0	0
2	0	0
3	0	1
4	0	1
5	0	2
6	0	0
7	2	1
8	0	0
9	0	1
10	3	1

Form	Frequency Group I	Group II
SRBCSS		
Comm-P (11 items)		
1	1	2
2	2	4
3	2	5
4	0	2
5	3	2
6	2	2
7	0	2
8	1	1
9	4	3
10	4	2
11	5	2
Comm-E (4 items)		
1	1	3
2	0	1
3	0	1
4	3	3
Plan (15 items)		
1	3	3
2	4	2
3	2	4
4	3	4
5	0	0
6	3	4
7	0	0
8	5	4
9	3	4
10	1	4
11	1	4
12	1	3
13	3	4
14	3	4
15	2	4

Form	Frequency Group I	Group II
RCS (15 items)		
1	0	2
2	0	2
3	1	3
4	1	4
5	0	2
6	5	11
7	1	4
8	0	2
9	0	3
10	2	4
11	0	2
12	3	4
13	0	3
14	1	4
15	2	2
TOI (7 items)		
1	0	3
2	0	2
3	0	2
4	0	3
5	0	2
6	1	2
7	0	2
NFPGS (9 items)		
1	1	2
2	1	3
3	0	2
4	4	3
5	2	1
6	1	2
7	0	1
8	3	3
9	0	3